

# THE IRON AGE

A Review of the Hardware, Iron and Steel Trades.

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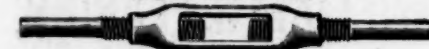
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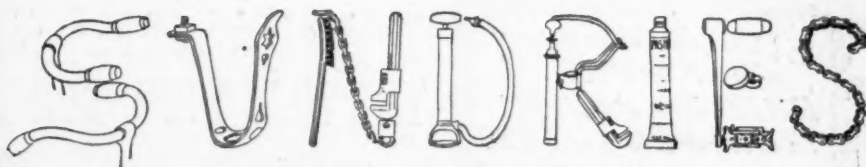
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 See Page 94.

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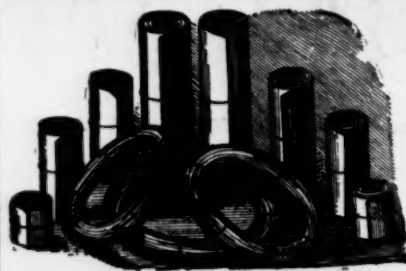
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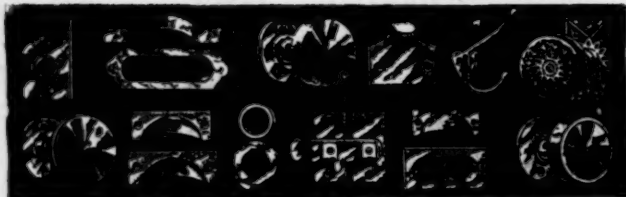
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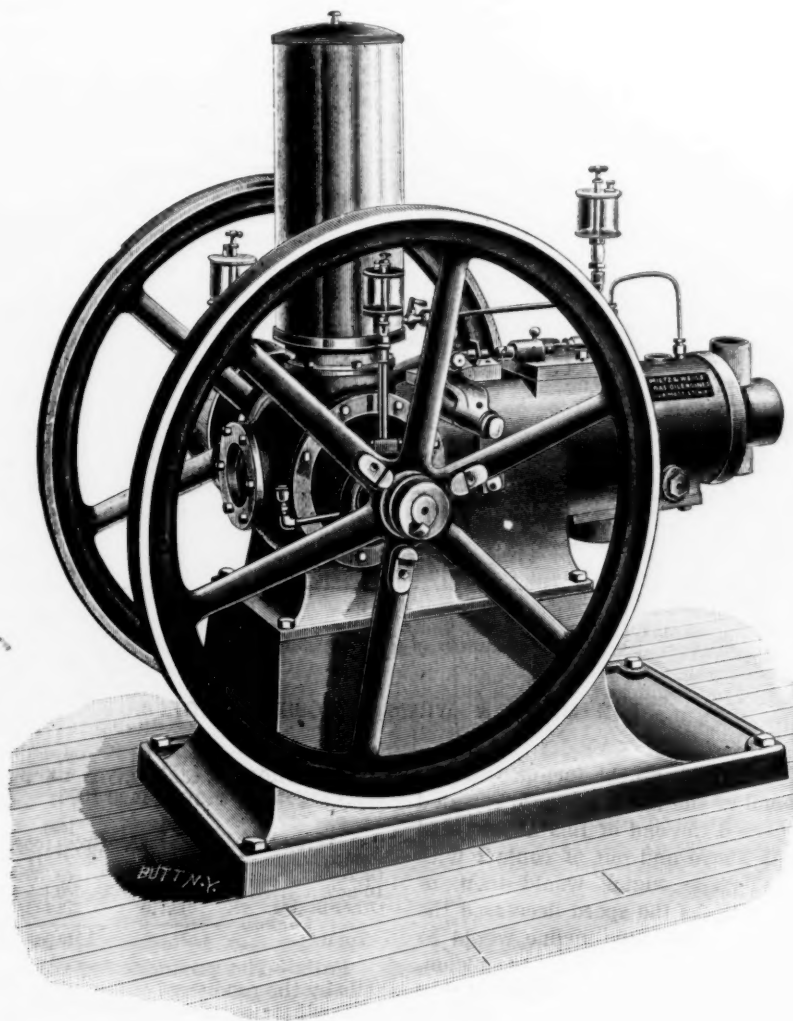
THURSDAY, MARCH 2, 1899.

## The Mietz & Weiss Kerosene Engine.

The Mietz & Weiss kerosene engine, manufactured by August Mietz of 128 Mott street, New York, receives, at full power, an impulse at each turn of the crank shaft—namely, the air and fuel injection, the compression and burning of the mixture, and the expulsion of the exhaust are all performed at a single turn. This is done in the most direct way and with the simplest mechanism. There are no cams, valves or side shafts,

cation throughout is positive and automatic, the oil for this purpose being forced by pressure to the parts needing it as long as the engine is in motion. The disagreeable odor which results in some forms of engines, due to the gases of combustion leaking past the cylinder, is entirely obviated in this construction since the exhaust pipe is of ample size, but mainly for the reason that a charge of pure air is passed through the cylinder at every revolution.

The following occurs at each revolution of the engine:



THE MIETZ & WEISS KEROSENE ENGINE.

the ports being so formed in the cylinder as to be opened and closed by the movement of the piston, which is of the trunk type. The cylinder thus controls the admission of the air and the time of the exhaust of the products of combustion. The requisite amount of oil is forced into the cylinder by a small pump placed on top of it, actuated through suitable connection with the crank shaft and controlled by a governor which is simple in design and effective in operation.

The crank shaft is placed in a chamber which is made air tight, and which forms practically an extension of the rear end of the cylinder. The side heads of this chamber carry the crank shaft bearings, thereby assuring rigidity. The bearings are made of phosphor bronze, and are formed with large wearing surfaces. The lubri-

The piston being supposed to be at the forward end of the cylinder, and the ignition to have taken place, the expansion drives the piston toward the rear, and during its passage it compresses air in its rear end, and, of course, also in the crank chamber. At the forward movement of the piston air under pressure from the chamber is admitted and permitted to blow through the forward end of the cylinder, thereby insuring the removal of all the products of combustion. At a certain stage in this forward movement the governor comes into play, operates the small pump, which forces the oil ahead of the piston into the forward end of the cylinder. The vaporized oil and air are mixed and compressed by the still moving piston until at the end of its stroke a second ignition occurs. It will thus be understood why

the engine when working full power receives an impulse at each and every revolution.

The engine is provided with an ordinary flame igniter, placed on the outward end of the cylinder, which is only required during the two or three minutes occupied in first starting. After that the igniter is extinguished, the ignition of the mixture of oil vapor and air being accomplished by the heat arising from their compression. The engine is entirely noiseless in operation, and runs with remarkable smoothness and with great uniformity in speed.

The action of the governor will be understood upon reference to the sectional elevation, Fig. 2. Oil from the tank, placed on top of the crank chamber is admitted to the small pump H. This pump is provided with an extended piston C, the projecting end of which is arranged to be struck by the moving link B. This link is attached to the upper end of a rocking lever, A, which is actuated by an eccentric on the crank shaft. The free end of the link B slides upon an inclined plate, D, which can be adjusted by means of the wing nut E up or down as may be necessary. This plate is formed with an upwardly inclined portion near its center against which the link strikes in its to and fro movement. If the speed of the engine should pass beyond the normal

Manhattan and the Bronx is 400,000,000 gallons. The reserve held in storage is 44,200,000,000 gallons, which at the present rate of consumption would be sufficient for the two boroughs for 182 days, without the natural flow of the rivers. The average daily consumption in Brooklyn in 1898 was 93,500,000 gallons.

### Production of Bessemer Steel Ingots and Rails in 1898.

The American Iron and Steel Association has issued complete statistics for 1898 of the production of Bessemer steel ingots and Bessemer steel rails in the United States, except the comparatively small quantity of standard rails and street rails which were made by manufacturers from purchased blooms or were rerolled from old steel rails. The ingot statistics embrace the production of steel castings by all Bessemer works.

**Ingots.**—The total production of Bessemer steel ingots in 1898 was 6,609,017 gross tons, against 5,475,315 tons in 1897, showing an increase in 1898 of 1,133,702 tons, or over 20 per cent. The production of 1898 was much the largest in our history. Of the total production 3539 tons were steel castings. The following table gives our production of Bessemer steel ingots and castings in the last six years:

Years.	Bessemer	Years.	Bessemer
Gross tons.	ingots.	Gross tons.	ingots.
1893.....	3,215,686	1896.....	3,919,906
1894.....	3,571,313	1897.....	5,475,315
1895.....	4,909,128	1898.....	6,609,017

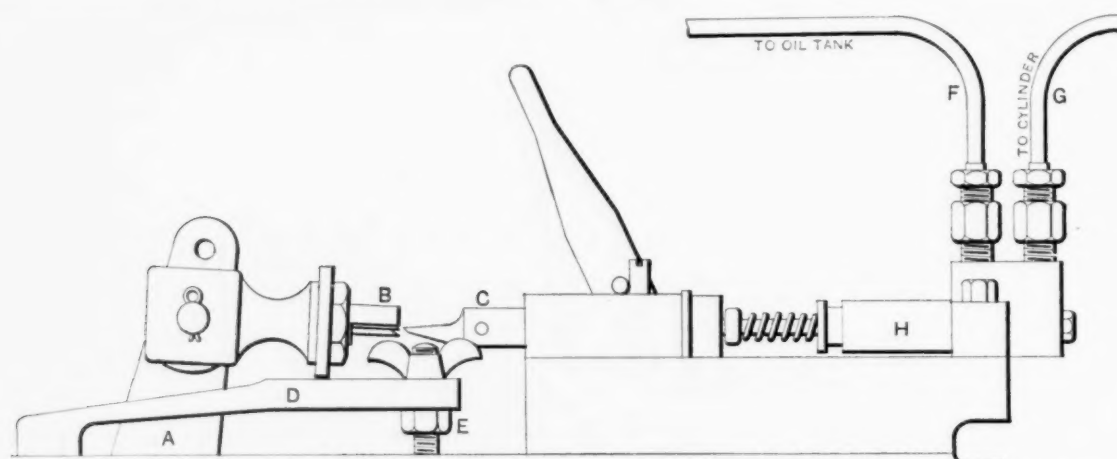


Fig. 2.—Elevation of Governor and Oil Pump.

### THE MIETZ & WEISS KEROSENE ENGINE.

the rapid movement of the link up the incline D would tend to keep the free end of the link in a more elevated position after it had passed the end of this incline, and it would therefore pass above and out of contact with the oil pump piston C. The engine would then, of course, receive no impulse. As the speed decreased the elevation of the link after passing the incline would be lessened, and it would come in contact with the piston, thereby forcing the oil into the cylinder and insuring an impulse at that revolution. The extreme simplicity of this design and its reliability in action will be appreciated.

Outside of the cylinder and crank this constitutes practically all of the moving parts of the machine. The economy of the engine is shown by the statement that the cost of 1 horse-power hour is less than 1 cent, with kerosene at 7 cents per gallon. The engine requires no attention whatever, and the escape of the burnt gases is so thorough that cleaning is unnecessary. The machine is made in sizes from  $\frac{1}{2}$  to 25 horse-power

The following table gives the production of Bessemer steel ingots by States since 1895:

	1895.	1896.	1897.	1898.
States—Ingots.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania.....	2,958,924	2,592,814	3,060,049	3,402,254
Ohio.....	719,954	568,535	1,041,541	1,489,115
Illinois.....	866,531	780,165	943,774	1,105,040
Other States.....	343,719	278,452	429,951	612,608
Total.....	4,909,128	3,919,906	5,475,315	6,609,017

**Rails.**—The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1898 was 1,955,427 gross tons, against a similar production in 1897 of 1,614,399 tons and 1,102,892 tons in 1896. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1887, when 2,044,819 tons were made. The following table shows the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last four years:

	1895.	1896.	1897.	1898.
States—Rails.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania.....	837,043	663,696	1,024,389	1,032,771
Other States.....	429,038	439,796	590,013	922,656
Total.....	1,266,081	1,102,892	1,614,399	1,955,427

At the request of the steel rail manufacturers there was separated for 1897, for the first time, the production of Bessemer steel rails weighing 45 pounds and less than 85 pounds to the yard from those weighing less than 45 pounds and over 85 pounds. This separation is continued for 1898, as follows:

	Under 45 pounds and less than 85.	85 pounds and over.	Total.
States—Rails.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania.....	67,558	670,290	311,923
Other States.....	52,368	712,343	137,945
Total.....	119,926	1,382,633	452,868

Luther Chapin, the founder of the Order of United American Mechanics, died at his home in Philadelphia, February 18, aged 85 years.

In his annual report, Commissioner Dalton of the New York City Water Bureau says that the maximum daily supply of the water system in the boroughs of



## The Mining Engineers.

The twenty-ninth annual meeting of the American Institute of Mining Engineers was held in New York from February 21 to 25 inclusive, the first business before the meeting on Tuesday evening being the reading of a paper by Dr. R. W. Raymond, entitled "A Biographical Notice of Dr. Albert L. Serlo," written by Prof. Hermann Wedding. Dr. Serlo was a leading German mine official, whose most widely known work was a treatise on mining engineering.

James Douglas of New York presented an illustrated description of the Copper Queen Mine at Bisbee, Ariz., owned and controlled by Phelps, Dodge & Co. of New York. The Copper Queen Mine was one of the early discoveries of Arizona, an outcrop being followed down into the limestones which opened out a large apparently isolated body of ore. Subsequently, after prospecting had been almost abandoned, further large deposits were opened, and since then the company have been large producers, and it is understood have enormous quantities of mineral in reserve.

Mr. Douglas discussed the genesis of the Copper Queen ore bodies, and then described the reduction plant, the most interesting features of which are the large trough converters which are now being introduced in some of the other leading mines of the country, United Verde, Arizona Copper Company, the Butte & Boston, and others.

The evening session was closed by the presentation of a series of lantern slides by E. E. Olcott on Peruvian mining. The views were taken in 1891, when Mr. Olcott was making an examination of the gold bearing gravels of Peru, and notably those of the Sandia district.

The announcement was made that the next meeting of the Institute was to take place in California in October.

Havemeyer Hall, Columbia University, was the meeting place on Wednesday morning, the session being opened by a few words of welcome from Prof. H. S. Munroe, who also presented a brief description of the plant of the university, referring to its resources and to its plans. There are now completed six large structures, part of the 23 which are ultimately to form the complete university. The endowments now amount to about \$10,000,000, while the real estate and buildings are valued at \$8,000,000.

C. Kirchhoff, president, then presented his annual address, which we print elsewhere. This was followed by a paper by Otto A. Moses on "The Lay System of Hydraulic Placer Mining," the aim of which is to extract gold from alluvial deposits in a flat country where there is little or no head of water and no outlet for dump. Professor Moses' paper was discussed, the general impression being that the application of the "Lay System" would naturally be limited. It is now in use at a number of phosphate deposits in Florida, and at one plant in Gulana.

Dr. H. M. Howe concluded the session with a paper on "The Metallurgical Laboratory," in which he discussed the expediency of endeavoring to carry out actual manufacturing operations within the university, and pointed out its limitations.

After a lunch and a visit to the different laboratories, workshops, museums, &c., Prof. J. F. Kemp opened the afternoon session with a description of the famous franklinite deposits at Franklin Furnace and Sterling Hill, which the Institute was to visit on Friday morning. His account of it was illustrated by a model showing the peculiar character of the ore body.

Prof. H. S. Munroe described the ore dressing laboratory at Columbia University, and dwelt upon the plans which are now being carried out to extend it. The principles followed out in this undertaking were fully exposed and seemed strikingly adequate to the varied requirements of the students.

The closing paper of the day was that of Robert H. Chapman, on the geological structure of the Rocky Mountains within the Lewis and Clarke Timber Reserve in Montana.

In the evening a reception was tendered by the New York members of the Institute.

On Thursday morning the fourth annual session of the meeting was opened at the rooms of the American Institute of Mechanical Engineers by the reading of a discussion on the Kytchym Medal. During a visit of a number of American geologists in Russia samples of the Kytchym Medal came into their possession, they being regarded as striking specimens of the Russian art of casting iron. At the Buffalo meeting, when the subject was first called up, O. S. Garretson of Buffalo proved by reproducing a badge that finer work could be accomplished in America, and since then evidence to the same effect has accumulated in the office of the secretary.

The most striking among them is a letter recounting the experience of Poulsen & Eger of the Hecla Iron

Works, Brooklyn. It is signed by N. Poulsen and we quote from it as follows:

### Artistic Iron Castings.

"When we started our business (some 20 odd years ago) we immediately aimed at making our castings for architectural work the best that could be produced by skilled workmen. Some time before you called on us I had made a trip to Europe, had there seen some very beautiful work of this kind, and, on my return, had brought with me samples purchased in Paris, Berlin and other European cities, but upon further inquiry found that they all came from Ilseburg, in Germany. I wanted to see if we could not make as good castings in this country, and went about it in this way:

"As neither Mr. Eger nor myself is a chemist, we were unable to analyze the iron, and therefore employed a mining engineer, Charles W. Miller (a member of your Institute), who had just graduated from Columbia College. We arranged for him a little chemical laboratory in our place of business, for the purpose of analyzing the quality of the iron in those German castings, and the different kinds of iron found in this country adaptable for foundry purposes. We found that the iron in the German castings was not superior to that we had in general use in our foundry. We then, together with him, studied publications on foundry work in regard to facings, sand, &c., and had him superintend experiments in our foundry. The foreman of the foundry did not like the idea of a young man fresh from college coming to show him how to make better castings, and repudiated the whole idea. But we went ahead; selected fine patterns from our stock; had facing and sand prepared according to the best information we could get; put the patterns into the hands of some of our best molders, and established Mr. Miller in the foundry to see that everything was carried out as he thought best. The result was a complete success. The castings we turned out were, I think, handsomer than those I had brought with me from Europe. We established the fact that we had the proper material, and also the skillful pattern makers and molders required.

"The molders got very much interested in their own work after seeing the fine results—so much so that they many times, together with ourselves, waited in the foundry until late in the evening, when the castings got cool enough to take out of the sand, just for the pleasure of enjoying their own handsome work.

"These experiments were the means of improving our ornamental castings for architectural work, which was what we were aiming at. Our work was generally recognized by architects to be far superior to that of our competitors at that time; and for many years after there was no other American establishment in our line of business who could produce such work. Now there are in this country many concerns which turn out very handsome castings, but I think we may fairly claim that they are all, more or less, the outgrowth of ours—employees of ours having either started out for themselves or taken positions in establishments already existing. Our little experiments have thus borne very good results. I think that to-day the ornamental iron work for building purposes produced in this country is superior to that from any other country, and is so recognized abroad.

"The fine artistic castings made by us in those days are still useful in our work, though we no longer produce them for the market. When, for any reason, we are dissatisfied with the work done by our pattern makers and molders, we bring out some of these old pieces, and tell them that what the foundry has done once it ought to be able to do again."

Charles Catlett of Staunton, Va., was called upon to read a paper on "The Coking in Beehive Ovens of the Coals of the New River District, West Virginia."

"The coke of the New River district is made from slack coal, which naturally carries an undue proportion of impurities; but, in spite of this, the coke will usually run only about 6 per cent. in ash. A shipment of coke made during 1898 by the New River Coke Company for special purposes, and from slack coal which had been screened to separate slate, &c., showed 4.23 per cent. ash. The coal from which this coke was made must, therefore, have carried about 3 per cent. of ash. This is sufficient to give an idea of the character of the coal in this particular. The material entering into the manufacture of coke will usually carry a larger amount of ash than this special shipment; but in all cases the coal makes a coke of special value for shipment to considerable distances, where the freight on even 1 per cent. of ash amounts to a good deal. The sulphur, while variable, is usually quite low, running from 0.50 to 0.60 per cent., but often less. Owing to the fact that the coke from this coal has been used to a very limited extent for the manufacture of Bessemer steel, little attention has been paid to the phosphorus contents, and but few analyses have been made. Those which have been ~~are~~ <sup>are</sup> 1e

show an exceptionally small amount of that objectionable element.

"A coal of the average composition would theoretically furnish about 75 per cent. of coke. As a matter of fact, the majority of the ovens in the district do not yield 60 per cent.; and from the result of my investigations and my observation of other ovens, I am satisfied that many of them run less than 55 per cent.

"This seems to be out of all proportion to what ought to be obtained, and indicates that, in addition to the volatile matter, about one-fifth of the coke is burnt up in order to secure the other four-fifths. It has been suggested by others that the insufficient amount of heat furnished by the gases alone might make it necessary to burn up a certain amount of the coke in order to complete the coking of the coal. I am not willing to admit that this is a fact; but, even if it be so, an undue amount is, beyond question, consumed. If comparatively smaller amounts of gas give smaller amounts of heat, it is all the more necessary to produce the largest possible amount of heat from the gases, and to conserve, in every possible way, what is produced. Far greater care is required in regulating the admission of air than is necessary with coals carrying an excess of volatile matter. It is obvious that if this could be so done as to coke the coal by the combustion of the gas alone, an enormous increase in yield and subsequent economy would result. I do not believe this is impossible.

"Mr. Catlett gives the records of a series of observations made with a set of eight ovens by means of draft boxes and summarizes the results as follows: It must be confessed that the figures given in these tables are by no means conclusive on any point; but they show what a small amount of air is at times necessary to burn out the oven in the proper time; and they have been productive of much good in directing attention to the excessive draft which had formerly been used, and have also served to call attention to the necessity of protecting the ovens from small leakages, and to emphasize the fact that every pound of air going into the ovens unnecessarily is a source of loss. They have also served as a basis for other investigations, of which circumstances did not permit a record, and have been, it is believed, instrumental in effecting an increase in the average yield for the year of 4 per cent. more than the ovens had ever produced before.

"Some tests were also made with reference to the size of the ring, which was originally very large, and which in many cases had been worn even larger. The serious loss of heat from this source does not seem to have been fully recognized. Rings of various sizes were experimented with, the smallest being about 11 inches in diameter. The results with this size were quite good, but the general indications were that it was a little too small; and 12 inches is believed to be about the right size for this coal and these ovens.

"It was also observed that several of the ovens, which had been rebuilt with a slightly higher crown, burned uniformly better and hotter; and the writer is satisfied that, for this coal, a 12-foot oven should not be less than 7 feet high. He believes that when ovens are built with reference to this particular coal, with the best possible protective covering, with a view to saving all of the heat possible, and with special provision for regulating the admission of the air and its more perfect exclusion when desired, a very much larger yield can be secured from this coal, and advantage would then be derived from its high carbon contents.

"This result cannot be secured without having, in charge of the draft, a man of more intelligence than can be commanded by ordinary laborer's wages; but it will be found to repay the investment. One per cent. saved on the yield of a reasonably large block of ovens would more than pay the salary of a good man; and 5 or 6 per cent. of increase in yield would mean a satisfactory profit. This increase is well within the range of possibility, as the present practice is not, as a rule, the result of careful investigation of the peculiar character of the coal."

P. H. Dudley of New York brought forward a paper entitled "Important Results Obtained in the Past Fifteen Years with the Stiff and Heavy Rail Sections."

Mr. Dudley's paper brought about a very animated discussion, which ranged over a wide field.

John Fritz, John Birkinbine, Dr. R. W. Howe, Dr. Raymond and others participated.

In the afternoon a party of members visited the works of the Nichols Chemical Company, at Laurel Hill, Long Island.

The evening session was given over to an elaborate and well illustrated paper by E. W. Parker of the U. S. Geological Survey in Washington on "Coal Cutting Machinery." After dealing with the statistics showing the enormous development in the introduction of coal cutting machinery in recent years, Mr. Parker took up in detail the different belt and cutter bar machines which are now manufactured in this country.

He discussed the question of the limitations of machines as affected by dip, &c.

Prof. W. C. Roberts Austin of London and Prof. F. Osmond of Paris were unanimously elected honorary members of the Institute.

The election of officers for the coming year resulted as follows:

President, James Douglas, New York.  
Vice-Presidents: E. C. Potter, Chicago; G. F. Kunz, New York; W. N. Page, Anstead, W. Va.  
Managers: Arthur Winslow, St. Louis; W. Glenn, Baltimore; W. J. Taylor, Bound Brook, N. J.  
Treasurer, Theodore D. Rand.  
Secretary, R. W. Raymond.

Among those in attendance at the meeting were the following:

W. S. Ayers, Hazleton, Pa.  
F. E. Bachman, general manager, Buffalo Furnace Company, Buffalo, N. Y.  
James C. Bayles, New York.  
John Birkinbine, Philadelphia.  
Fred. A. Canfield, Dover, N. J.  
Charles Catlett, Staunton, Va.  
J. Parke Channing, New York.  
R. H. Chapman, United States Geological Survey, Washington, D. C.  
F. L. Clerc, Denver, Col.  
W. B. Cogswell, Solvay Process Company, Syracuse, N. Y.  
U. S. De Camp, New York.  
W. F. Downs, Dixon Crucible Company, Jersey City, N. J.  
P. H. Dudley, New York.  
A. Eilers, Colorado Smelting Company, Brooklyn, N. Y.  
L. W. Francis, Witherbee, Sherman & Co., New York.  
John Fritz, Bethlehem, Pa.  
B. F. Fackenthal, president Thomas Iron Company, Easton, Pa.  
F. L. Garrison, Joplin, Mo.  
W. Glenn, Baltimore, Md.  
E. O. Goss, Scoville Mfg. Company, Waterbury, Conn.  
A. Heckscher, New Jersey Zinc Company, New York.  
Henry D. Hibbard, New York.  
Prof. H. M. Howe, Columbia University, New York.  
Dr. H. O. Hofman, Massachusetts Institute of Technology, Boston.  
W. H. Hulick, Warren Foundry, New York.  
G. S. Humphrey, C. W. Hunt Company, New York.  
A. E. Hunt, Pittsburgh Reduction Company, Pittsburgh, Pa.  
D. S. Jacobus, Stevens Institute, Hoboken, N. J.  
A. O. Ihlseng, Carthage, Mo.  
John N. Judson, American Metal Company, New York.  
W. G. St. G. Kent, Yonkers, N. Y.  
Prof. J. F. Kemp, Columbia University, New York.  
William Kent, New York.  
F. H. Knight, Hokendauqua, Pa.  
L. G. Laureau, New York.  
J. H. Lee, Baltimore, Md.  
E. M. McIlvain, Bethlehem Iron Company, South Bethlehem, Pa.  
W. F. Mattes, Scranton, Pa.  
G. W. Maynard, New York.  
W. B. Middleton, Taylor Iron & Steel Company, High Bridge, N. J.  
Spencer Miller, Lidgerwood Mfg. Company, New York.  
E. C. Moxham, Bertha Mineral Company, New York.  
Prof. H. S. Munroe, Columbia University, N. Y.  
E. E. Olcott, New York.  
G. D. Ormrod, Allentown, Pa.  
I. P. Pardee, Hazleton, Pa.  
E. W. Parker, United States Geological Survey, Washington, D. C.  
J. B. Porter, McGill University, Montreal.  
C. W. Purington, Boston, Mass.  
A. C. Rand, Rand Drill Company, New York.  
A. J. Rossi, New York.  
H. J. Seaman, Catasauqua, Pa.  
J. M. Sherrerd, Taylor Iron & Steel Company, High Bridge, N. J.  
Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.  
Prof. John C. Smock, Trenton, N. J.  
Henry Souther, Hartford, Conn.  
E. J. Spilsbury, New York.  
H. H. Stoeck, Scranton, Pa.  
J. A. Walker, Joseph Dixon Crucible Company, Jersey City, N. J.  
W. R. Webster, Philadelphia.  
W. H. Wiley, New York.  
Oliver Williams, Catasauqua, Pa.

Late advices from Australia report that millions of dollars' worth of crops have been ruined by the drought



in that country and many thousands of cattle and sheep are dying for lack of water and pasturage. This is the third consecutive year of extraordinary dry weather in that country. The losses involved amount to a national disaster.

### The Orton Friction Clutch for Small Powers.

While the solid friction clutch illustrated herewith is of small dimensions it is capable of taking care of comparatively large powers. It is so constructed as to be entirely self contained—that is, it will take its full clamping or friction power without moving either the shafting or pulley. As indicated in Fig. 2 it employs multiple friction plates, the contact being accomplished by elbow

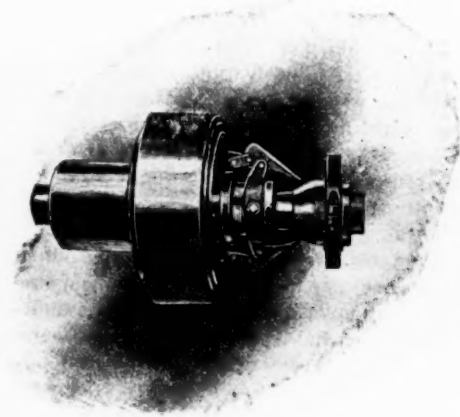


Fig. 1. - The Orton Clutch.

levers operated by a sliding conical sleeve. It is understood, of course, that the pressure brought to bear on the first plate is transmitted to the second, then to the third, &c., and as all are drivers and splined to the main driving hub, the power transmitted is multiplied by this arrangement. The clutch is always in balance and can be operated at any speed, or can be used on countershafts where reverse motion is required, as a duplex clutch. It is made by the Dodge Mfg. Company of Mishawaka, Ind., to transmit from 2 to 50 horse-power.

A watch of remarkable perfection is described in the *London Times*, its distinction resting on the fact of its having just gained the Kew certificate of "Class A, Especially Good," with the extraordinary high marks of 88.1 out of a possible 100. To win the latter a watch would have to be absolutely perfect as a time keeper, a result admitted to be scarcely within the range of practical achievement. This watch, an all English pocket chronometer, has a mean variation of daily rate amounting to only  $\frac{1}{3}$  second, and the mean difference between the extreme gaining and losing rates to 4 seconds. The makers attribute this result to the use of a revolving escapement or tourbillon, a device in which the frame that carries the escapement is made to revolve slowly, but continuously, in the main frame by the action of the watch, thus reducing the error in time keeping from change of position—a piece of mechanism which does not materially increase the complication of the watch, involving, in fact, the addition of one wheel only. While the marks of this watch for temperature compensation are not claimed to be unsurpassed—as many as 19.7 having been recorded out of 20—those for smallness in variation in daily rate and for absence of positional errors are unusually good.

England is about to follow the lead of this country in the equipment of her railroads with automatic couplings. Francis J. S. Hopwood, assistant secretary of the British Board of Trade, who has charge of the Railway Department of the bureau, recently returned home from a special mission to the United States and reported strongly in favor of the American automatic couplings system. He showed indisputably that there has been a great saving of life since the adoption of such couplings on the American railroads. Thereupon the president of the Board of Trade announced in the House of Commons last week that he would introduce a bill to compel railroad companies to adopt automatic couplings. The bill, which was introduced on Monday last, gives the Board of Trade power, five years hence, to compel all British railroads to supply the whole of their rolling stock with these safety devices.

In presenting the bill, President C. T. Ritchie of the Board of Trade frankly said the object of the measure was "to follow the example set by our cousins in the United States."

### The Largest American Built Steamships.

The two big Pacific Mail liners for which contracts have been awarded to the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., will be of the following dimensions: Length, 550 feet; beam, 63 feet; draft, 31.5 feet; displacement, 18,500 tons, and contract speed, 18 knots. When finished these ships will be the largest ever built at an American shipyard. Compared with the American liner "St. Louis," the largest American built ship afloat to-day, the Pacific Mail ships will be of 7,870.79 tons greater displacement, 14.5 feet longer and will have a draft 4.7 feet greater. The beams of the two ships are the same. When the vessels are completed they will rank third in displacement among the notable big ships afloat. The "Oceanic," now building in England, will have a displacement of 28,500 tons.

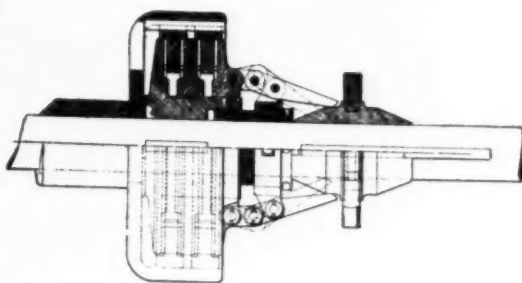


Fig. 2.

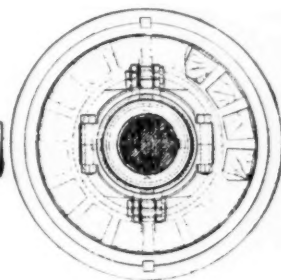


Fig. 3.

Sectional Elevations of Clutch.



Fig. 4. - The Clutch on Pulley.

### THE ORTON FRICTION CLUTCH FOR SMALL POWERS.

The "Kaiser Wilhelm der Grosse" has a displacement of 20,000 tons. The Pacific Mail ships will rank next with 18,500 tons. The "Campania," though her general dimensions are larger, has only 18,000 tons displacement. While the contract speed of the two new Pacific Mail vessels is placed at 18 knots, it is understood that the builders will endeavor to give them a higher speed than that. It is expected that they will reduce the present record time between San Francisco and Chinese ports by from 12 to 18 hours. A large electric cantilever crane, 750 feet in length, is being constructed at the Newport News Shipyard, and under this, one on each side, the big Pacific Mail ships will be built.

## A Decade of Progress in Reducing Costs.\*

BY C. KIRCHHOFF.

For 20 years it has been my work to watch and record progress in both the technical and the commercial branches of mining engineering in the wide sense in which it is represented by our institute. While you who have been actively engaged in our profession have made history, a few of us have attempted to be the historians and have been kept keenly on the *qui vive* to follow the developments of so broad a field. One so employed may be pardoned if he ask you to pause for the unusual purpose of looking backward, that you may measure what you and others have done, and that the younger men may gather inspiration from the work accomplished by their elders and their predecessors.

It is not so long since that the commercial management dominated our industries. Bred in the school of science, which seeks its reward in establishing the truth, our engineers were sometimes indifferent to trade conditions and requirements. Much of that feeling has disappeared and the engineer recognizes that it is his mission to apply the achievements of science to a useful commercial end. On the other hand business men now understand that the utilization of our natural resources and the production of articles for consumption is impossible without the intervention of the engineer. They must co-operate, unless, indeed, the two functions are not combined in one man—a rare but powerful combination.

Now the final measure of success of both is the cost sheet on the one hand and the expansion of markets on the other, so closely interwoven, so mutually interdependent. There is one cardinal feature, however, which characterizes the engineer's work—namely, the permanence of his achievements. Every improvement, particularly when it has been recorded in such lasting form as a paper in the "Transactions" of our societies—every improvement represents an advance from which there is no receding. It means that ground has been conquered which will never be surrendered. From time to time we have epoch making discoveries which advance the art at a bound, but I venture to assert that in the aggregate greater progress is made in the direction of reducing costs by minor improvements in practice and equipment.

It is my purpose to present some data which shall reflect that movement, and indicate to what extent it has been responsible for the rapidity with which we have conquered and are now fortifying our position as contributors to the world's requirements. The most convenient method for such an estimate naturally is to follow the course of prices, but this does not go below the surface. A comparison of costs strikes deeper because it may be expected to reveal in what directions most has been accomplished, and along what lines further development is possible and profitable.

Now, of course, we all know that to the producer nothing is usually more sacred than his cost sheet, and it is not easy for an outsider to get frank and accurate statements of this class. But there is less difficulty in obtaining a statement showing relative figures. A number of concerns have furnished to me reports showing in percentage of the costs of a base year how the outlays varied for a series of years, and these I shall use in the present occasion, without giving the names of the respective establishments.

It may be urged that one serious defect is inherent in any method possibly employing data obtained from plants of comparatively greater age. The point will be naturally raised that individual concerns may not have kept up with the times in equipment and, possibly, in practice; that those who were banner bearers of progress five or ten years since have, involuntarily or other-

wise, resigned the leadership to younger rivals, the shortness of whose career excludes them from those who have made history for a whole decade. The assertion seems plausible that the results based upon the returns from individual producers do not necessarily reflect the entire advance accomplished in a decade.

Such objections can, frankly, be only met with the necessarily vague and therefore partially unsatisfactory reply that the concerns selected are among the largest, and are believed to be in the front ranks of the progressive producers of this country. There must be coupled with this assurance the disclaimer that the results possess value beyond that of being illustrative of the progress made. The absence of any such statistics gives those presented a value. However keen might be the desire to expand and multiply them, it must give way to the practical difficulties of collecting them and interpreting them in detail without revealing their origin. A further objection might be that the results obtained may be exaggerated, because it was only the stress of the struggle during recent years which brought into line with modern practice plants whose management was not up to standard during the entire years of the decade.

Statistics of this scope tell only a part of the story, because they must naturally be restricted to those operations and plants in which revolutionary changes in methods have not been introduced to defeat comparisons. If we were to trace the lowering of cost of Western copper for the whole decade we must naturally stop with the matte, since Bessemerizing is of only recent introduction and was at first developed tentatively.

There are few open hearth plants more than ten years old which have not in that time swung wholly or partially from the acid to the basic process.

Valuable though they be, statistics of this character can only partially express and reflect progress. Figures bearing on cost of product deal with the article manufactured only with reference to quantity. They fail to show how the standard has been raised as to quality—both as to excellence and as to uniformity. Data bearing, for instance, on the percentage of seconds in a rail mill, or rejections in rolling plates, structural material or bars, might be convincing as to a part of the progress effected, and yet would tell only a part of the truth because specifications have become more stringent and inspection more severe and searching.

The general proposition is true, therefore, that we can only reflect in statements of cost a part of the achievements of the American mining engineers and metallurgists of the past decade, and that an important though undefinable addition thereto has been conquered in the form of a fuller utilization of raw materials, of more effective handling of labor, of increased safety to men and plant, of heightened quality and uniformity of product, of greater regularity of employment of equipment and of prompter and more certain filling of consumers' orders. It need hardly be pointed out that improvement along these lines is as real an advance as is the crowding down of fuel or labor cost, and it will be frankly acknowledged by the engineer that the co-operation of the commercial management must be credited with a large share of it.

All these factors tell upon the balance sheet, which after all is the most important document for the engineer to study. While he is usually more intimately and directly concerned with the expenditures, he does and should influence the receipts through quality of product and promptness and reliability of deliveries.

Now that the American mining and metallurgical industries have stepped into the world's arena, our engineers have had placed upon their shoulders the greater responsibilities which come with wider opportunities. The reproach has been often made that we are lavish if not reckless with our natural resources. Few will deny that there has been much justification for this reproach in the past, and that in some respects we are still at fault. While it is true that there were times when it did pay

\* Presidential address read before the American Institute of Mining Engineers.



to waste, it is certain that these days are passing. We may be justly proud of the vast resources with which this country has been blessed. But far greater glory than mere pride of possession is that of having successfully striven to develop to the utmost the opportunities thus accorded to us for the good of our country and of mankind. To contribute to that end has been both the aim and the achievement.

Cost of Pig Iron.

Permit me to submit first the following table showing the fluctuations in the cost of making pig iron of a large furnace plant in the South:

Comparative Statement of Pig Iron Costs for the Years 1889 to 1898, both Inclusive, with the Figures of 1889 Taken as a Unit Basis.

Year.	Product per day, tons, per cent.	Coke consumption per ton iron, per cent.	Ore cost, per cent.	Lime-stone cost, per cent.	Coke cost, per cent.	Labor cost, per cent.	Cost of arbitraries, per cent.	Cost of sundries, per cent.	Total cost, per cent.	Average selling prices, per cent.	Net average profit, per cent.
1889.....	100	100	100	100	100	100	100	100	100	100	100
1890.....	94.1	99.4	107.6	87.6	99.4	112.8	103.3	105.8	104.3	103	85.1
1891.....	101	102.3	98.22	97.6	102.8	81.8	103.3	99.6	97.1	94.6	79.7
1892.....	98.1	100.6	104.5	53.7	100.8	70.2	106.6	112.2	95.1	87.1	38.7
1893.....	120.6	94.7	105.8	67.1	94.6	60.5	100	90.8	89.6	76.9	...
1894.....	166.7	91.2	85.4	54.7	72.6	41.6	88.3	70.1	69.7	65	36.5
1895.....	155.7	91.2	76.6	81.2	74.5	55.3	95.6	47.1	69.8	64.9	35.7
1896.....	164.4	101.2	78	41.6	70.6	50.9	127	42.1	67	64.6	50.8
1897.....	184.3	84.1	78.4	24.5	64.8	50.2	116.6	37.4	63.2	59.5	37.5
1898.....	167.7	91.2	79	40.3	64.1	51.9	113.3	33.4	63.4	61.2	47.9

MEMORANDA.—Only 11 months included under 1898, January to November inclusive. Arbitraries cover relining charge, general office expense, taxes and insurance. Sundries cover sand, brass and iron castings, coal to locomotives and engines and boilers and pumps, all small tools and furnace supplies.

These figures have been plotted on the accompanying diagram, in which for convenience sake the fluctuations in the daily product have been started from the base line. (See Fig. 1.)

producers. On that account the record shows strikingly, in the absence of that modifying factor, what has been achieved in the direction of lowering costs through improved practice in the preparation of materials and in smelting.

In other sections of the country the rapid decline in the cost and in the charges for the transportation of ore by land and on the Lakes, and for the carriage of fuel, has been a very important item in the cost account. In the South credit for what has been accomplished need not be divided by the iron maker with the carrier.

It will be observed that there was a pronounced fall, notably in 1894, and that now in recent years the cost is

only about 63 per cent. of what it was in 1889. As the largest single item the coke cost is the most worthy of study, and here we have the interesting observation that while the cost per ton of product has been reduced to 64 per cent. of that of 1889, the consumption, so far as quantity comes into play, has undergone only a moderate reduction—a fact which comes out clearly in the case of other furnace returns. In the South very impor-

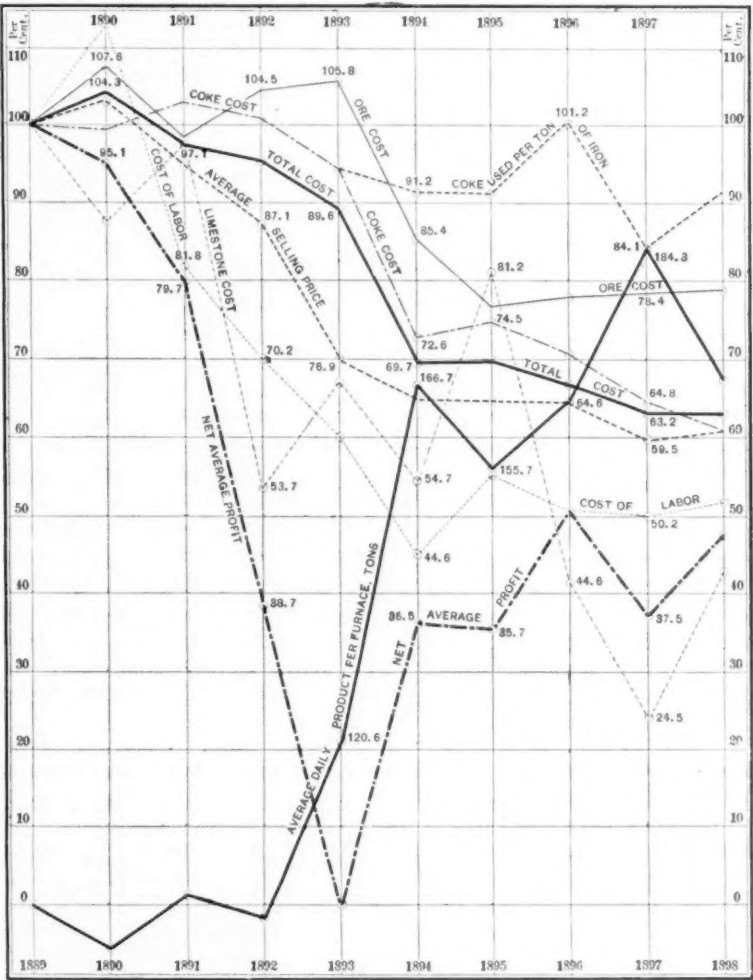


Fig. 1.—Fluctuations in Cost of Production of Pig Iron. - Southern Plant.

This series is particularly interesting because the cost of freights on assembling materials, which is the dominating factor in the production of pig iron in other sections, is relatively of little importance to the Southern

tant progress has been made in the preparation of the coal for coking, which has favorably affected cost in other directions, too.

The lines of cost of ore and of limestone show some-

what curious irregularities, which are due to the fact that the burden has changed. In the earlier years a large percentage of soft ores was used. Since these carried no lime, the cost for stone was consequently larger during that period. In the more recent years a much larger percentage of calcareous ores was

the selling price, and the line bearing on profits. The former shows a greater decline than the cost line, so that the profit was at all times less. The year 1893 carried it down so that it was only slightly above the zero line, and altogether it shows the most extraordinary irregularities.

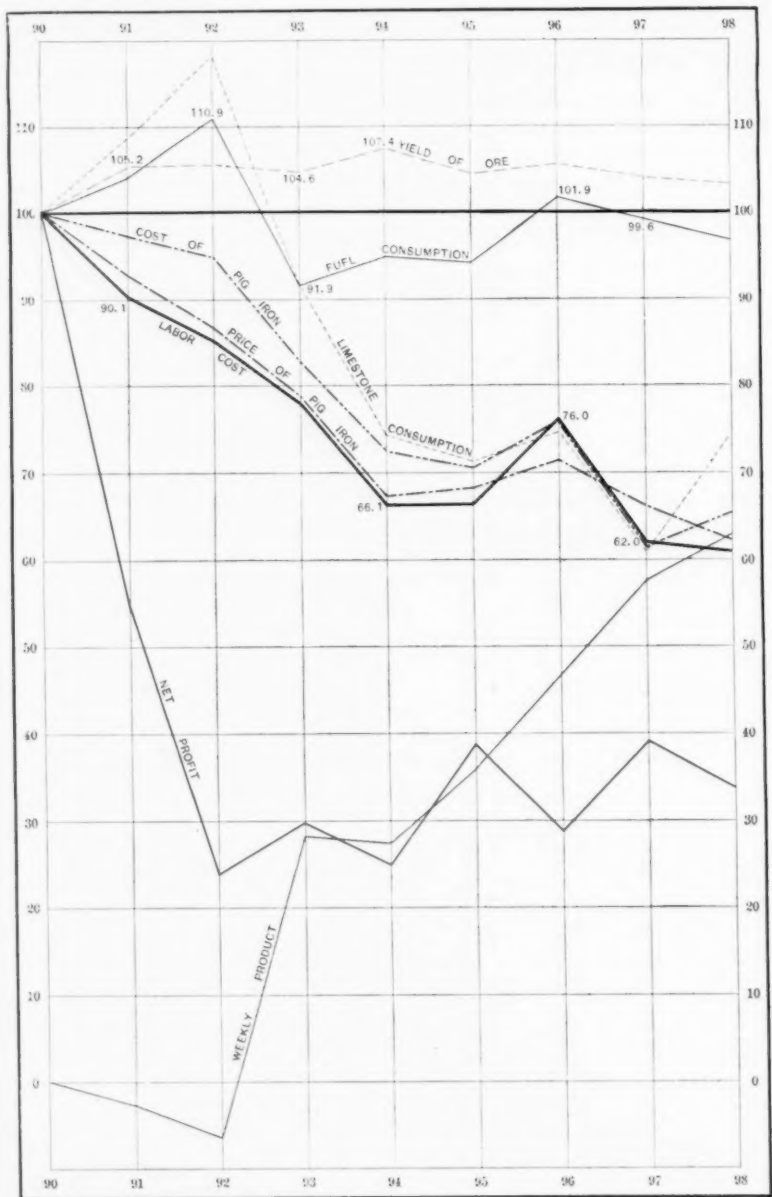


Fig. 2.—Fluctuations in Cost of Pig Iron. — Eastern Plant.

charged so that practically the cost of limestone has been eliminated, since for prolonged periods no stone whatever enters into the burden.

The labor cost has been cut down to about one-half, that and the minor items of cost, like "sundries," being largely affected by the output, whose growth is clearly shown in the line starting from the base. The daily output nearly doubled during the decade under review.

I am indebted to the manager of what is regarded as the best handled furnace plant east of the Alleghanies and north of the Potomac for the following data, based upon the work done in the year 1890, which, owing to a combination of circumstances possibly not general, was the most profitable year encountered. The accompanying diagram furnishes a ready means of grasping the main points. (See Fig. 2.)

Comparative Statement of Pig Iron Costs, 1890 to 1898 Inclusive, 1890 Taken as a Unit Basis.

Year.	Product per day.	Fuel per ton of iron, per pounds.	Ores per ton of iron, per cent. yield.	Lime-stone per ton of iron, per pounds.	Wages for labor	Incidental and office expenses.	Average price of iron, f.o.b. furnace.	Cost of ores, fuel, stone, wages, incidentals and office expenses.	Net profit.
1890.....	100	100	100	100	100	100	100	100	100
1891.....	97.2	104	105.2	108.4	90.1	101.5	92.5	97.2	54.4
1892.....	93.6	110.9	105.7	118.0	85.1	106.1	86.6	95.1	23.9
1893.....	128.0	91.9	104.6	91.5	78.0	81.5	77.8	83.1	29.7
1894.....	127.5	94.9	107.4	74.1	66.1	83.1	67.3	72.4	24.9
1895.....	135.9	94.3	104.2	71.7	66.2	76.9	68.2	70.7	38.9
1896.....	128.0	101.9	105.7	74.7	76.0	92.3	71.7	75.7	28.5
1897.....	157.8	99.6	104.0	60.9	62.0	69.2	66.1	69.9	39.3
1898.....	163.3	97.0	103.7	74.5	61.1	70.6	62.2	65.8	33.9

An additional line of very great interest may be referred to, and that is the one giving the fluctuations in

The plant was stopped for three months and four months respectively in 1892 and 1896 for repairs, which



affected cost, notably in the latter year. Improvements and betterments are not included in the cost of the iron.

It will be observed that the total cost of materials, wages, incidentals and office expenses has been quite sharply reduced, in spite of the fact that the quantity of fuel consumed has undergone but little reduction during the past decade. The labor cost has been reduced nearly 40 per cent. The output per day showed a sudden in-

this plant uses almost exclusively lake ores, the cost of material has, of course, also undergone a very sharp reduction. The figures submitted, however prove that the practice has achieved some very excellent results quite apart from economies due to lower cost of raw materials at point of shipment, and decreased cost of assembling, through reduction in lake and inland freights. (See Fig. 3.)

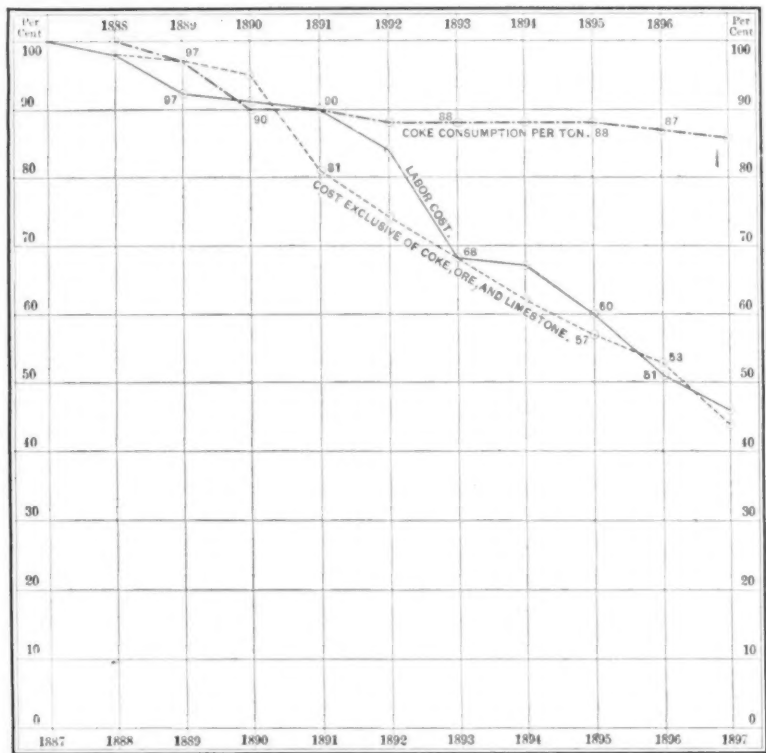


Fig. 3.—Fluctuations in Cost of Pig Iron.—Central West.

crease in 1893 and has developed very rapidly since that date.

A third series of records is that dealing with the results of a large works in the Pittsburgh district, which deals with the following items:

- 1. The comparative cost of labor.
- 2. Total cost of making pig iron, exclusive of cost of ore, coke and limestone, but including labor, materials for repairs, running expenses, fuel for steam, &c.

Comparative Cost for Specified Items for Ingots, Between 1891 and 1898, Both Inclusive—Base : 100 for Each Item in 1891.

	1891. Single turn.	1892. Single turn.	1893* Single turn.	1894. Double turn.	1895** Double turn.	1896. Double turn.	1897+ Double turn.	1898 : Double turn.
Pig iron, less credit for scale and cinder.....	100.0000	101.2589	86.4425	70.0326	67.9603	84.6220	78.0918	65.4183
Scrap, excluding that produced.....	100.0000	84.1342	99.4787	62.6313	73.3790	72.4942	67.8865	52.5344
Spiegel .....	100.0000	102.6397	90.0522	72.6357	63.1480	78.7662	72.4856	64.7593
Limestone .....	100.0000	91.1398	69.9667	83.5275	77.9118	71.3810	97.1298	84.8170
Fuel .....	100.0000	81.3459	68.9953	77.5838	73.8717	101.3897	93.5336	100.1628
Steam .....	100.0000	100.9630	97.3355	81.8299	80.5457	74.5425	75.3772	124.4623
General supplies, taxes, insurance, &c.....	100.0000	85.0706	89.1656	77.4463	76.3872	51.3535	49.4063	59.6652
Molds .....	100.0000	68.4488	72.1039	48.9880	54.1811	45.3329	67.9827	30.1931
Labor .....	100.0000	94.9360	86.4882	66.0190	70.0309	88.9315	84.3855	74.5680
Cost per ton.....	100.0000	97.6929	89.0286	69.3371	68.3455	81.3022	75.8014	64.3931
Product per turn.....	100.0000	104.6933	97.2465	98.4726	105.3859	116.5679	115.0105	107.2259

3. Coke consumption per ton of pig iron.

Year.	No. 1. Labor cost. Per cent.	No. 2. Cost exclu- sive of raw materials. Per cent.	No. 3. Coke consumption. Per cent.
1887.....	100	100	100
1888.....	98	98	100
1889.....	92	97	96
1890.....	91	95	90
1891.....	90	81	90
1892.....	84	74	88
1893.....	68	68	88
1894.....	67	62	88
1895.....	60	57	88
1896.....	51	53	87
1897.....	46	44	86

The most striking facts are that a relatively considerable saving has been effected in the consumption of fuel, that the labor cost has been crowded down to less than one-half and that the cost of converting the raw materials into pig has been lessened even more. Since

Cost of Bessemer Ingots.

While, generally speaking, information relative to costs of producing pig iron is quite frequently published, data bearing on the cost of converting pig into steel by the Bessemer process are not often available. One of the large Eastern steel works have furnished the figures for the following tables, the first showing the fluctuations in the cost of the principal items in producing ingots, using 1891 as the base year. (See Fig. 4.)

The plotting produces a rather confused diagram, but when the line of total cost is compared with the individual lines the progress in different items is more readily traced. Naturally the overwhelmingly large proportion in the cost of the materials carries the total cost line close with it. Out of the whole cost, that of pig iron, scrap, spiegel and limestone together amounted to the

\*September 15, 1893.—Reduction of 10 per cent. except for common labor. December 20, 1893.—General reduction of from 10 to 35 per cent.

\*\*July 1, 1895.—General increase in wages of 10 per cent.

+April 1, 1897.—Readjustment of tonnage rates amounting to an average reduction of 12 per cent., common labor and wages being undisturbed.

‡Improved machinery put in operation August 1, 1898, causing delay and decreased product during three months.

following percentages of the whole in the different years, the percentage of the other years being as stated:

Year.	Materials. Per cent.	Fuel and steam.	Molds, supplies, taxes, insur- ance, &c.	Labor.
1891.....	87.91	1.91	4.54	5.63
1892.....	89.17	1.65	3.70	5.47
1893.....	88.68	1.58	4.26	5.47
1894.....	88.02	2.16	4.46	5.37
1895.....	87.55	2.00	4.58	5.78
1896.....	88.80	2.27	3.86	6.16
1897.....	88.12	2.28	3.33	6.28
1898.....	86.87	3.09	3.52	6.53

The participation in the cost of its different constituents is shown in the following table:

comes the following statement showing how the cost of conversion has been reduced during the past decade:

*Cost of Conversion of Bessemer Ingots, Exclusive of Raw Material.*

Year.	Per cent.
1887.....	100
1888.....	95
1889.....	94
1890.....	94
1891.....	86
1892.....	86
1893.....	72
1894.....	66
1895.....	62
1896.....	54
1897.....	52

*Comparative Cost of Ingots Between 1891 and 1898, Both Inclusive—Base : 100 for Total Cost Per Ton in 1891.*

	1891. Single turn.	1892. Single turn.	1893* Single turn.	1894. Double turn.	1895** Double turn.	1896. Double turn.	1897+ Double turn.	1898 : Double turn.
Pig iron, less credit for scale and cinder..	63.5087	64.3082	54.8985	44.4768	43.1607	53.7423	49.5951	41.5463
Scrap, excluding that produced.....	11.0691	10.0701	11.9067	7.4064	8.7828	8.6769	8.1254	6.2879
Spiegel.....	12.1947	12.5166	11.9816	8.8577	7.7007	9.6053	8.8394	7.8972
Limestone.....	2.404	2.191	1.682	2.008	1.873	1.716	2.335	2.039
Fuel.....	1.5975	1.2995	1.1022	1.2394	1.1801	1.6197	1.4942	1.6091
Steam.....	3.115	3.145	3.032	2.549	2.509	2.322	2.348	3.877
General supplies, taxes, insurance, &c.....	3.0403	2.5864	2.7109	2.3546	2.3224	1.5613	1.5021	1.8140
Molds.....	1.5020	1.0281	1.0830	7.358	8.138	6.809	1.0211	4.535
Labor.....	5.6358	5.3594	4.8743	3.7207	3.9468	5.0120	4.7558	4.2025
Cost per ton.....	100.0000	97.6929	89.0286	69.3371	68.3455	81.3022	75.8014	64.3931
Product per turn.....	100.0000	104.6933	97.2465	98.4726	105.3859	116.5679	115.0105	107.2259

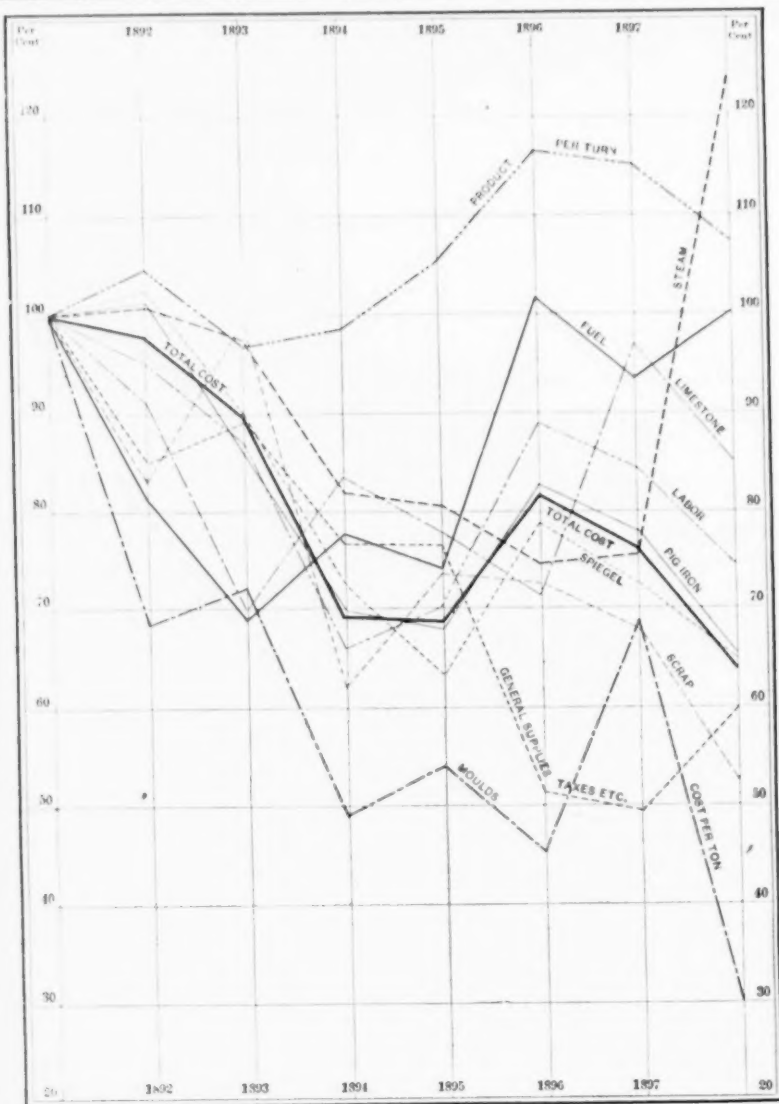


Fig. 4.—Fluctuations in Items of Cost of Producing Ingots.

The accompanying diagram shows in a broad way how the materials, the labor and the other items contribute to the cost. (See Fig. 5.)

From a large steel works in the Pittsburgh district

\*September 15, 1893.—Reduction of 10 per cent. except for common labor. December 20, 1893.—General reduction from 10 to 35 per cent.

\*\*July 1, 1895.—General increase in wages of 10 per cent.

+April 1, 1897.—Readjustment of tonnage rates, amounting to an average reduction of 12 per cent. in same, common labor and day wages undisturbed.

: Improved machinery put in operation August 1, 1898, causing delay and decreased product during three months.

The cost of conversion at this plant has, therefore, been nearly cut in two in 11 years.

An effort has been made to obtain some data relating to the reduction in cost of the manufacture of open hearth steel, but thus far without success. Few plants have been makers in this branch on a large scale for so long a period, and in the case of those who have the majority have swung partly or wholly from acid to basic steel.

In the case of puddling the difficulty has been even greater, since works which ten years ago produced large



quantities of muck bar have either abandoned the manufacture altogether or are running so intermittently that no data of value are available for recent years.

#### Cost of Rolling Rods.

Probably in no branch of rolling mill work has progress been so marked as in the making of wire rods, and that branch has been selected as an illustration. William Garrett of Cleveland, Ohio, has compiled the following record of the progressive development of the output

1. Improved methods in mining, by which a larger percentage of coal is recovered. By concentrating the operations a reduced cost for haulage and maintenance of mine tracks is effected.

2. Improvements in mechanical haulage appliances, like pneumatic haulage, the endless rope system and the tail rope system. With the introduction and extension of these there has been coupled an improvement in the character of mine tracks by better grading, the use of heavier rails, the employment of larger ties and of bet-

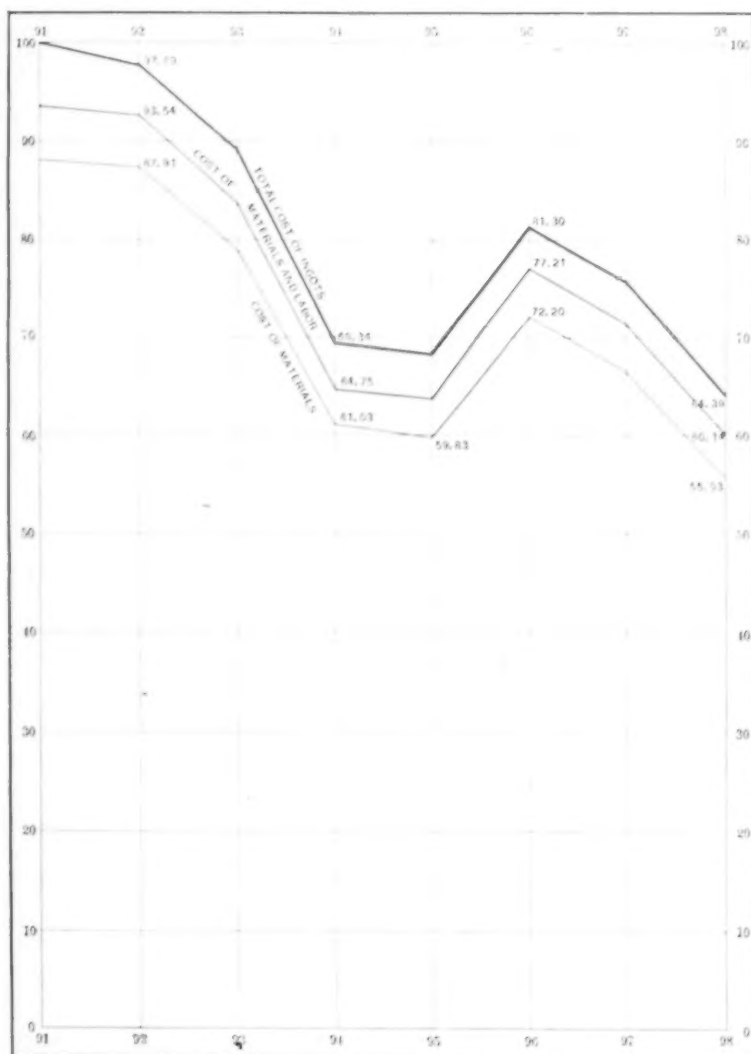


Fig. 5.—Fluctuations in Cost of Producing Bessemer Ingots.

per 24 hours and the cost of the conversion of the 4-inch billets into the wire rods. (See Fig. 6.)

#### Cost of Wire Rod Rolling.

Year.	Product per 24 hours.	Cost of Rolling.
1888.....	100	100.0
1889.....	150	95.4
1890.....	175	90.9
1891.....	185	90.9
1892.....	200	87.3
1893.....	225	86.4
1894.....	250	77.3
1895.....	290	74.5
1896.....	280	72.7
1897.....	300	68.2
1898.....	325	63.6

In reality the period under review only displays partially the progress made in this branch since the introduction of the Garrett mill.

Considerable as were the difficulties in obtaining data for comparison in the iron industry they were naturally very much greater in mining, because the disturbing factors are more numerous. Thus it was impossible for a large miner of coal and producer of coke to submit detailed data. In a general way, the development is indicated by the fact that, representing the cost of production of coke for the year 1887 by 100, the cost for the year 1897, figured in per cent. of the cost of 1887, was 87.3 per cent. The reductions in cost have been due to the following:

ter equipment generally. This has resulted in increased loads, higher speeds and consequently a larger output at reduced cost per ton for hauling, and has more than compensated for the increased length of haul due to the retreating of the mine workings from the pit mouth.

3. Improvements due to taking advantage of gravity in hauling loaded and empty cars at the shafts, and to the introduction of automatic dumping appliances on the tipples.

4. Improvements in mine drainage by judicious concentration, by installing larger pumping appliances and by the substitution of compressed air for steam for the purpose of draining points in the mines remote from the power plant.

5. The substitution of steam locomotives and endless gravity rope appliances for mule power for conveying the coal from the bins to the ovens and charging the latter.

6. The increased output of the coke ovens by increasing their size and by more carefully and scientifically operating them.

A highly significant statement in connection with this interest is that while from 1887 to 1897 the cost fell from 100 to 87.3, the earnings of labor increased from 100 in 1887 to 112.5 in 1897.

**Cost of Lead Smelting.**

What progress has been made in lead smelting and refining is well illustrated by the following series of figures from a Western plant:

Year.	Money cost of ore smelted and refined.	Full consump- tion per ton of ore smelted.
1887.....	100	100
1888.....	98	97.5
1889.....	97	97.1
1890.....	95	95.4
1891.....	93	95.2
1892.....	91	92.6
1893.....	88	92.1
1894.....	85	91
1895.....	79	85.6
1896.....	74	79
1897.....	65	71.2

Parallel with this improvement has gone another movement which it is somewhat difficult to express, but which nevertheless is one of much significance, and

first impulse is to reply in the negative, since it is admittedly more difficult to effect reductions after they have once cut down costs to a certain point. Speculation is useless, but hopes are being held out that may be closer to a realization than many may be willing to admit. It is only necessary to point to the use of electric appliances in coal mining, to the introduction into this country on a large scale of European by-product ovens, to the rapid developments lately of the slag cement industry, to the utilization of the blast furnace gases for power production, to the continuous open hearth process, and to the latest achievements in rolling mill work.

Technical knowledge is becoming more and more a common possession of all producing countries. The race is one in which one and then the other contestant is in

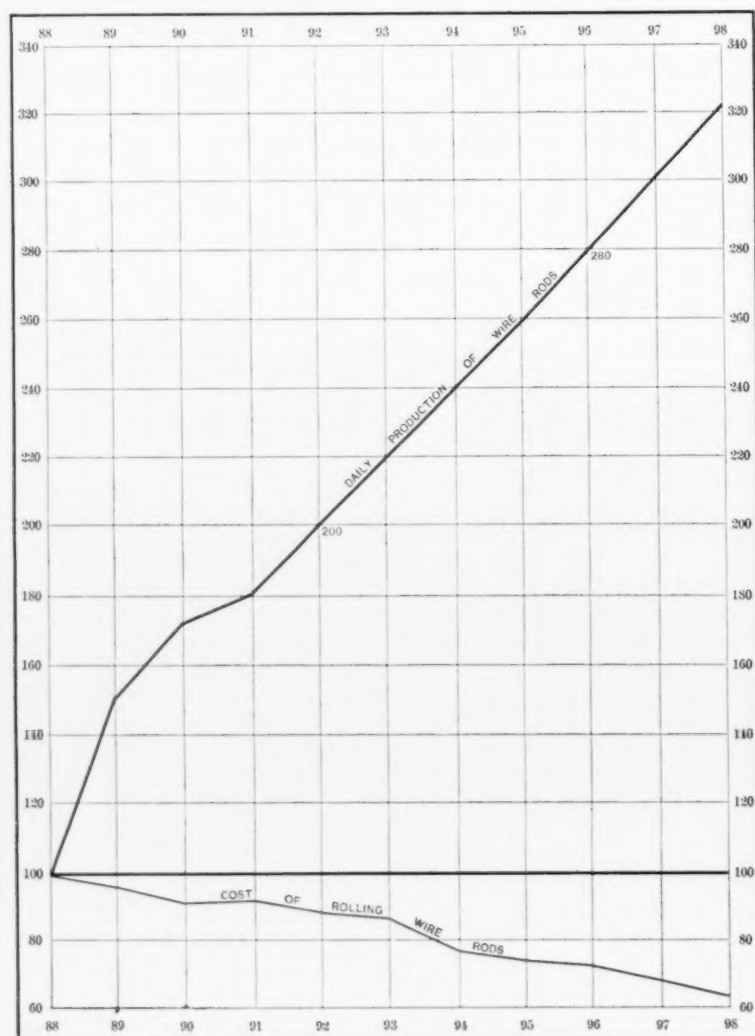


Fig. 6.—Fluctuations in Cost of Rolling Wire Rods and in Output.

that is the ability to smelt successfully charges lower in lead. It has varied more in accordance with the supply of lead ore at any particular plant than with its ability to smelt with more or less lead. Previous to 1890 10 per cent. of lead was considered the minimum charge for satisfactory work. Since then, at the plant to which the data refer, charges as low as 6 per cent. have been used.

The reduction in cost has been due to the introduction of labor saving appliances, and to the fact that the use of larger smelting furnaces has required less attendance per ton of ore treated. The notable reduction in the fuel consumption is partly due to the introduction of larger furnaces, and partly to improved and more intelligent methods of firing.

These examples, I believe, illustrate how rapidly, in every branch, costs have been reduced during the past decade, and they naturally lead to the question whether we may hope to continue such a rate of progress. The

the lead. The strain of competition is becoming more and more severe. That under such circumstances the mining engineer will not in the future crowd the records of the past it is difficult to believe. I sincerely hope that coming volumes of our "Transactions" will bear out that expectation.

The stockholders of the William Cramp & Sons' Ship and Engine Building Company of Philadelphia, at a special meeting held last week, authorized a new issue of \$1,500,000 thirty-year first mortgage 5 per cent. gold bonds, for the retirement of all outstanding obligations of every description, including \$537,000 maturing mortgage bonds and \$500,000 of secured floating indebtedness, and to provide a sufficient working capital.

Governor Thomas of Colorado has sent a special message to the State Legislature urging legislation to prevent the consummation of the contemplated smelter combination or the formation of any "trusts" in Colorado.

### A Two Thousand Horse-Power Rope Drive.

The Webster Mfg. Company, Chicago and New York, make one of their specialties the manufacture and installation of manila rope drives. They have had a large experience in this line, and have equipped their factory in Chicago with the latest machinery for the purpose. In their system of power transmission by rope they use only grooved iron sheaves, in the construction of which great care is used to make each groove of exactly the same size as the others. In this way the same speed is given to each individual rope, making all the ropes run as one rope. The company claim that a material must be used for sheaves which will not permit the grooves to wear into different diameters, that being destructive of the success of any rope drive in which more than one strand of rope is used. If the grooves are not of the same diameter one rope will gain on the other, and the strain which results soon wears out or breaks the rope.

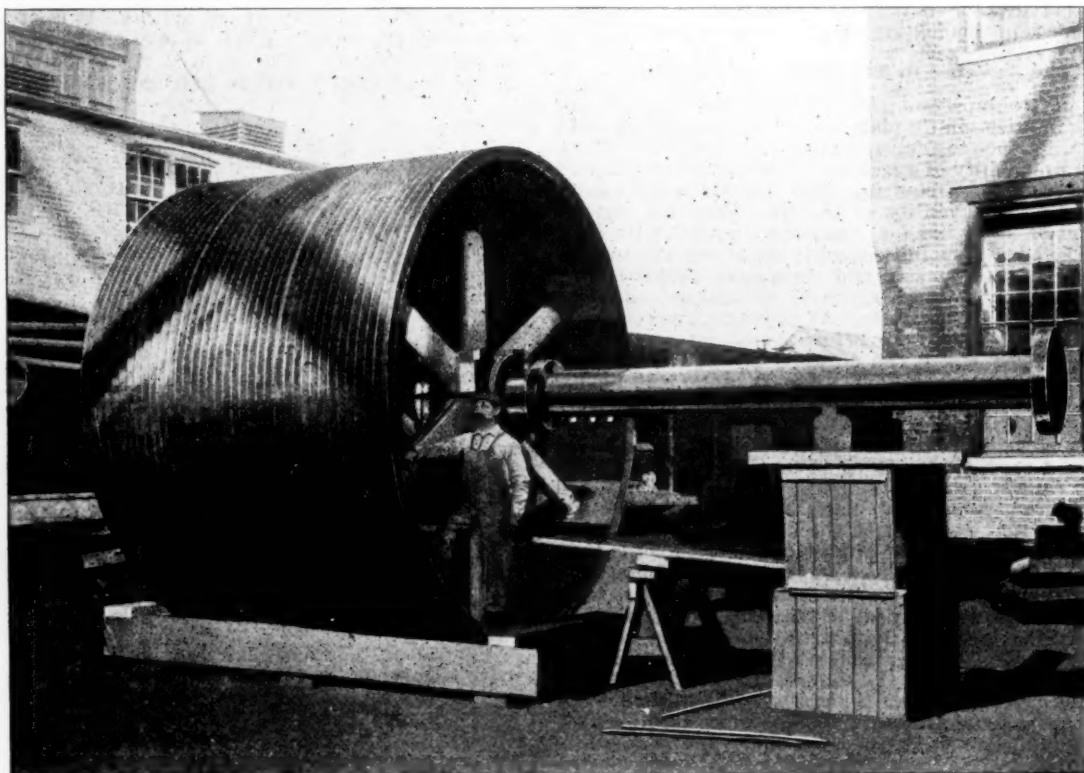
The above company have recently equipped with their machinery the new Armour grain elevator D in Chicago. The illustration given herewith shows a large sheave, 12 feet in diameter, on a 12-inch shaft, for the main drive of this elevator, to transmit 2000 horse-power. That rope transmission is practical and economical is demon-

to quench the fire, but without effect. Now the whole pile will have to be removed or a new track built.

### The Londonderry Iron Company, Limited.

It is thought that the furnace plant and ore mines of the old Londonderry Iron Company, at Londonderry, Nova Scotia (now in liquidation), may be leased by Montreal people who would operate them until the completion of the Dominion Coal Company's furnaces at Sydney, or longer. The Londonderry ores make a low phosphorous foundry pig of remarkable strength when used alone. In late years they are mixed heavily with high phosphorus ores, bought outside, making an iron only suitable for stove plate and cast pipe, but quite unsuitable to the Western consumers, thus causing the Londonderry brands to practically disappear out of those markets and contributing a share to the causes of the final shut down of the Londonderry furnaces.

There are still very large deposits of ore at Londonderry. Some of the best levels have been neglected in the last ten years and practically abandoned though showing good ore in face and bottom. The old Siemens iron made here was famous in its days, and with proper



A TWO THOUSAND HORSE-POWER ROPE DRIVE.

strated by its rapid adoption during the past few years for the transmission of large powers. The advantages are many. The drives are positive; the automatic tension carriage which goes with the rope takes up the slack, and as the strain is put on the rope the tension pulls it more and more taut, giving a positive power instead of slipping, as often occurs on a belt pulley. Another great advantage claimed for the rope drive is that it is compact, taking up much less space than belts. It can be run around corners and carried into almost any place or position, thus often effecting a large saving where gears would have to be used. It is perfectly noiseless, and also is not affected if the shaft is slightly out of line, but will adjust itself to uneven conditions of the shaft when they are not too pronounced.

A portion of the Buffalo, Rochester & Pittsburgh Railroad, near Punxsutawney, Pa., will have to be rebuilt as the result of a curious accident which occurred last week. It appears that when the work of laying down the road was started last spring the contractors took a quantity of cinders and coke dust from the adjoining coke yards for the foundation of a large filling. Last week smoke was seen issuing from the road, and the filling began to sag. It was soon apparent that the coke beneath was on fire. Holes were dug and thousands of gallons of water were poured in in an effort

management and a realization of modern conditions there is every reason to suppose that these ores could be used advantageously to manufacture pig iron that should command a high price in the English market. The property has been offered to Eastern capitalists. The company went into liquidation early in 1899 with an indebtedness of \$160,000, owing to the Bank at Montreal. No bonds have ever been placed on the property, and at time of liquidation all local and minor indebtedness was fully paid up. Operations at the plant in late years have been generally successful, but profits were swamped by heavy fixed charges and depreciation charges to overcome the original inflation of values in all departments. The plant has only been running part time of late as suited the requirements of the banks.

Secretary of State John Hay has recommended to Congress the participation by the United States in the International Exposition to be held in Glasgow, Scotland, in 1901. The recommendation is based on a letter from the British Ambassador at Washington, in which Sir Julian Pauncefote states that he has been directed to bring the subject before this Government, and expresses the hope that the United States will give its support and recognition to the undertaking. It is proposed to appropriate the sum of \$35,000 for the organization of a commission by the State Department to care for American exhibits.



### Pacific Coast News.

SAN FRANCISCO, CAL., February 20, 1899.—We now have had dry weather for some time and the thirsty earth cries out for rain. Every one was encouraged by the precipitation which came with the new year, but now that the rains have apparently ceased, there is dire foreboding. Taking this in conjunction with the extremely dry weather during the closing months of 1898, a good many people already predict a failure of crops and the dullness that comes with a barren year. But while there is undoubtedly some cause for anxiety, timely rains can avert the threatened disaster. At the present time business in these lines is rather dull, although clearing house exchanges still show a marked improvement compared to those of the corresponding time in 1898. The reason of this is not far to seek. In January, 1898, there was a great activity in all lines of business owing to the demand for the Klondike, and outfits of tools and general hardware ran up as high as \$100 per capita; but in February this trade fell off heavily and clearing house exchanges went down. This year there have been no such disturbing causes. Trade has been fairly good for the season in the lines which are usually in demand at this time. There has been a sympathetic appreciation in various articles where there has been an advance in the East, but not in all cases a proportionate one. This results from the fact previously stated that advances in the East cannot always be followed by advances in this market, and the same is true of falling prices.

#### The Advance in Tin Plate and Pig Tin.

But in two important articles there has been a heavy increase in price—in tin plate and pig tin. This will make quite a difference to packers on the coast this year. There is every probability of a fruit and salmon pack of 4,500,000 to 5,000,000 cases—requiring, say, 350,000 boxes of tin plate and a large quantity of pig tin. Coke tin plate is quoted at \$4.50 per box for American and \$4.75 for English. The advance is fully equal to \$1 a box, making the increased cost to packers and consumers \$350,000. We very much doubt whether this is for the benefit of the Western canned goods trade. At any rate, the prices are no higher than they were before American competition became a fixed fact. The advance in pig tin has been most striking. It has gone up to 36 cents, just double what it was at the close of the year, and is higher than we ever before remember it in this market. This adds, should the price be kept up, another \$350,000 to the burdens of the canned goods trade—14 to 15 cents to the cost of each case of canned fruit or salmon. The high prices will bring pig tin here from all parts of the world, and cause us to regret that we have not tin mines and factories of tin plate. There are some crumbs of comfort for the English manufacturers also, as they have a practical monopoly of the tin plate intended for the British Columbia salmon packers, and for a great deal of the canned goods shipped from this port to Great Britain, the Australian Colonies and New Zealand. The advance in the price of tin plate gives an opportunity for the establishment of a keg factory in San Francisco; but I doubt whether there are any of our local capitalists with sufficient enterprise to undertake its establishment. Of course, there are many obstacles in the way, but none that cannot be overcome by proper energy, sufficient capital and proper knowledge of the business. The imports of tin plate have been very light for some time, except by rail, and no pig tin came on the last Australian and Chinese steamers.

#### The Exports of Machinery.

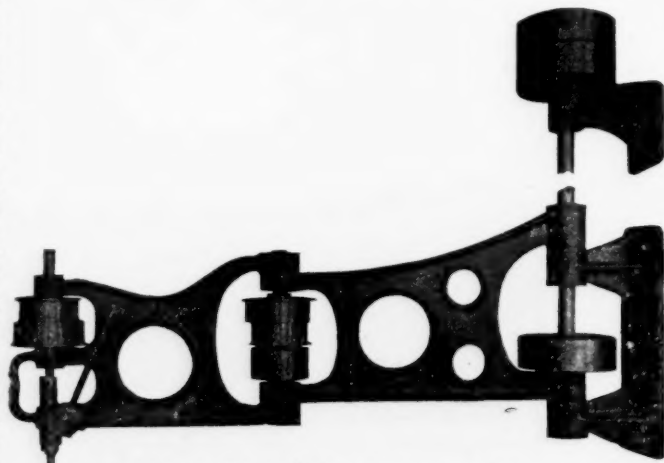
The exports of machinery for 1898 were the largest ever made from this port, without including the large amount of foreign in transit, of which I have already given you information. The total to the Hawaiian Islands for the year was valued at \$612,113. This is an increase of 50 per cent. over the figures of 1897, and though some came from the East in transit, and more represented Eastern machinery sold in this city, the principal part of the increase must be credited to the machine shops and foundries of this city. To Mexico we sent machinery valued at \$225,235. To Australasia the shipments were valued at \$184,999—a decline of about 14 per cent. from 1897. Japan took machinery valued at \$163,328, of which a large proportion represented Eastern in transit. In this 1898 scored an increase of one-third over 1897. We sent to China shipments valued at \$44,223. This is about 16 per cent. less than in 1897. The other principal shipments were \$41,231 to Central America and \$43,081 to British Columbia. There were some shipments for the Klondike, too, but no account has been taken of them. A great deal of machinery was sold for the steamboats and river boats for the Northern gold fields, not to speak of the fact that the steel steamer "St. Paul," for the same trade, was built at our local shipbuilding works. She is now under charter to the Government as a transport to the Philippines. The Hawaiian Islands constituted the great market for our exports of iron and steel and their manufactures during the year. We sent there \$119,840 of pipe, and the same article to the

value of \$37,971 to Mexico. Some of this was wrought or cast iron pipe, an Eastern article, but most of it sheet iron pipe manufactured in this city. Of the barbed wire exports 1,010,920 pounds, valued at \$23,590, went to Mexico—the principal foreign market for it from this city. Castings for various purposes to the value of \$190,250 went to the Hawaiian Islands—an increase of about 8½ per cent. over 1897. The shipments of boilers and parts of them to the Hawaiian Islands were valued at \$79,819. This is an increase of over threefold. Shipments to the value of \$19,866 were made to Australasia. The value of pumps and pumping machinery to the Hawaiian Islands was \$76,294. Miscellaneous articles of hardware, &c., to the Hawaiian Islands were valued at \$126,073—an increase of about 9 per cent. over 1897. Shipments to other countries included \$58,980 to Mexico, \$29,273 to Japan and \$23,363 to British Columbia. This enumeration gives the principal articles and countries with their values for one of the most notable years in the history of the trade. And in the export business 1899 promises to be more notable still.

J. O. L.

### The York Post Radial Drill.

The post radial drill here shown, made by the S. M. York Company of Cleveland, Ohio, is particularly intended for use where a number of holes are required in a single piece of work at one setting. It is of rigid design and all parts subject to wear are bushed with phosphor bronze. The main upright shaft is 1 7-16 inches in diameter and is extended sufficiently to be



THE YORK POST RADIAL DRILL.

driven from the driving shaft of the shop. The upper pulleys are for a 2-inch belt, while the cone pulleys are for a 1½-inch belt. The spindle has 3 inches of feed by means of the lever shown. As the machine is split at both joints it can be clamped to a stationary position if required.

### Paper Wrapped Cables.

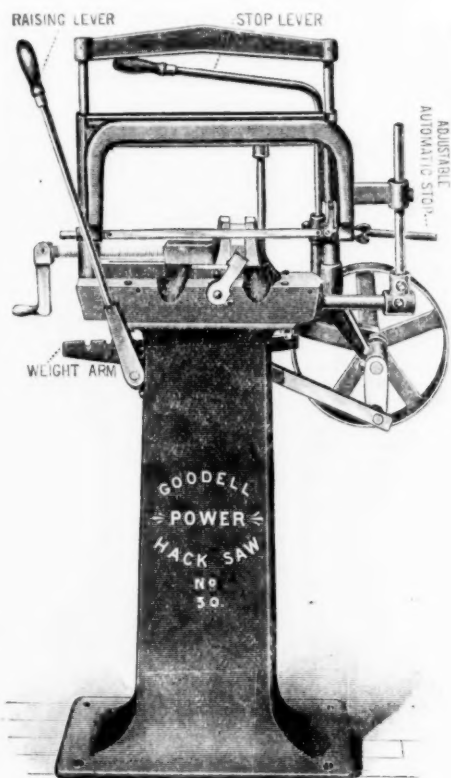
The London *Electrical Review* says that the paper insulated cable for telegraph and telephone work, now being laid between London and Birmingham, will be the longest of the kind that has hitherto been undertaken. The cable used is of the lead covered, paper insulated, air space type, and is being manufactured by two British electric companies at Prescott and Woolwich. Each pair of conductors is wrapped with strong, specially prepared paper, free from metallic particles, in such a way as to completely inclose the wires and to perfectly insulate them both from each other and from neighboring conductors.

The insulated pairs are then stranded into a compact and symmetrical cable. Additional paper insulation is laid on spirally between each completed layer of pairs, so as to form a suitable bed for the next layer. A final wrapping of at least one thickness of paper, or of other suitable fibrous material is added between the outer layer and the lead sheath, which is of the finest English lead, applied at a temperature not exceeding 600 degrees F. The cable is drawn into 3-inch cast iron socket pipes, laid in sections of 150 yards, leaving a gap of 4 feet 2 inches for the purpose of jointing the sections of cable. These pipes are being laid at a depth of 2 feet below the surface of footways, and 2 feet 6 inches below the surface of roadways, which depths will insure against crushing by heavy weights passing over the roads. At distances of 5 miles the cable is brought up to distribution boxes, fixed in test pillars, somewhat resembling a pillar letter box, provided for the purpose.

This cable, which is to be 150 miles in length, is now completed as far as Fenny Stratford, a distance of 50 miles, and several telegraph circuits are working through this section. Up to the present time 94 miles of pipes have been laid, 74 miles of cable have been drawn into the pipes, 980 cable joints and 75,000 wire joints have been made.

### The Goodell Power Hack Saw.

The new power hack saw made by the Goodell Brothers Company of Greenfield, Mass., will take in work  $4\frac{1}{2}$  x  $4\frac{1}{2}$  inches. The raising and stop levers, as shown in the engraving, are convenient to the hand of the oper-



THE GOODELL POWER HACK SAW.

ator when he stands in front of the machine. The automatic stop can be set to stop the saw at any desired depth or after the bar has been cut off, and is instantaneous in its action. The stop or starting lever is connected directly with a clutch upon the main driving pulley, which either locks or disengages it with the crank shaft of the machine. The frame which carries the saw runs back and forth in a guide which in turn slides up and down the perpendicular guide rods; the traveling motion is conveyed to it by the horizontal guide rod, which runs parallel with the blade of the saw. The saw blade always runs parallel with the bed of the vise. The latter is so constructed that it is perfectly square with the saw and the bed of it, extending beyond the jaws, avoids the possibility of sawing into the end of the work after it has been cut off.

**Information Wanted.**—A correspondent asks for the name of any one who would likely undertake the job of welding the steel on 3000 malleable iron shear castings; also the address of any specialists in shear grinding.

Information is desired as to the approximate tonnage of tungsten used in this country and in Europe, the present market price per ton in New York and the principal source of the present supply.

**The Virginia Company.**—Moore & Schley of New York, who were the underwriters of the Virginia Iron, Coal & Coke Company, announce that the negotiations have been completed. The officers of the company elected on the completion of the transfer are: President, George L. Carter of Pulaski, Va.; first vice president and treasurer, E. P. Chapman of Moore & Schley, this city; M. D. Chapman, second vice-president and assistant treasurer; T. F. Davis, secretary. The officers of the Virginia & Southwestern Railroad, now owned by the Virginia Iron, Coal & Coke Company, are identical in both instances,

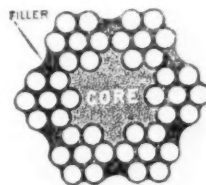
with the exception that E. L. Delaney is second vice-president of the railroad, taking the place of M. D. Chapman. At the company's office it was stated that they intended to make use of the numerous facilities for mining coal and iron to the greatest possible extent. About 15 miles of railroad will be built, making the total mileage controlled over 110 miles.

### The Standard Underground Cable Company.

A special meeting of the stockholders of the Standard Underground Cable Company of Pittsburgh will be held in that city early in May, at which the capital stock will be increased from \$1,000,000 to \$1,500,000, to provide for the purchase of a new site and the erection of buildings that will allow the doubling of the capacity of the present works. The company now have an earned surplus of \$430,000, and it is the intention to issue \$350,000 of this as a stock dividend to the stockholders, while the latter will be allowed to subscribe for the additional \$150,000 worth of stock, to be issued in proportion to the number of shares they hold. This, with the \$80,000 cash left in the surplus fund, will give the company \$230,000 in cash for the purchase of a site, the erection of new and much larger buildings and the installation of the finest and most modern machinery in the market. The present plant of the company is located at Sixteenth and Pike streets, where the property only measures 100 feet wide by 157 feet long. This is covered with two, three and four story buildings that are now crowded to their capacity. Last year the orders received by the concern amounted to \$1,300,000, while so far this year orders to the amount of \$600,000 have been received. An order for 16,000 feet of lead covered paper insulated underground telephone cable was received a few weeks ago from the Japanese Government for the imperial telephone line in course of construction in Tokio. In December an order from the same Government was received for 40,000 feet of overhead cable, rubber insulated, for the Tokio telephone system. Other large foreign orders have been received and the domestic business has exceeded all expectations. Mark W. Watson is president of the company and J. W. Marsh vice-president and general manager. Frank A. Rinehart is secretary and treasurer. The directors are Mark W. Watson, B. F. Jones, John B. Jackson, James H. Willock, John Moorhead, Jr., George B. Hill, J. N. Davidson, Robert Pitcairn and J. W. Marsh.

### Wire Rope Filler.

The acquirement of a material for treatment of the manila or jute core in the process of manufacture of wire ropes, possessing pliability, lubricating and water proof qualities, and free from destructive acid, has been desired by wire rope manufacturers. There are numerous places where wire ropes are liable to become water soaked almost immediately after installation (where not specially prepared to resist moisture), such as cable railway service, wet mines, dredging machinery, power transmission and in many other exposure places. The wire ropes of elevators in offices, stores, warehouses and general buildings sometimes show an outside corrosive effect, which too often is but suggestive of the more serious hidden internal conditions. Not infrequently the interior of wire ropes reveals disintegrated cores and corroded wires, even where there may be but little evi-



WIRE ROPE FILLER.

dence of deterioration externally. The illustration herewith presented shows application of a special material known as wire rope filler, by which the core is lubricated and a flexible cushion interposed between it and the strands. The filler, exuding between the wires, prevents abrasive wear, seals against gaseous or water attacks, and forms a foundation on which an outside coating should speedily build. The manufacturers of this filler, the Ironsides Company, Columbus, Ohio, also make an outside coating, termed wire rope shield, for external protection against abrasive wear and to completely seal against exterior attacks. A substantial increase of life is evident from the internal treatment and furthered by the external protection.



## New Steel Car Works at McKee's Rocks, Pa.

We have been officially advised by Edward A. Schoen of the Pressed Steel Car Company of Pittsburgh that the new steel car works to be erected by that company will be located at McKee's Rocks, Pittsburgh. The site purchased for the new plant contains about 120 acres and is claimed to be admirably located as regards receiving and delivering materials. Already orders have been placed for \$700,000 worth of large machine tools, and the buildings will cost \$250,000. About 3000 men will be employed. The property has a long river frontage on the Ohio River and will be directly opposite the Allegheny plant of the company. It will have every facility for receiving heavy freight by water, and will also have connection with the Pittsburgh & Lake Erie and the Pittsburgh, Chartiers & Youghiogeny railroads. The contract for the steel buildings was awarded some time ago to the Riter-Conley Mfg. Company of Pittsburgh. That concern are now at work on the material. Four main buildings, each 1000 feet long and 70 feet wide, will be erected for the erecting and painting departments, and three buildings, each 650 feet long and 70 feet wide, will be built for the shearing, pressing, punching, riveting and assembling departments. A large power house will also be erected at the water's edge, so that fuel can be handled cheaply. A machine shop will be added to the group of steel buildings.

Six hydraulic presses, ranging in size from 700 to 1200 tons each, have been ordered from Mackintosh, Hemphill & Co. of Pittsburgh, and two of 800 tons from Bement, Miles & Co. of Philadelphia. Fifteen riveting machines, each with 9 feet 2 inches gap, have been ordered from the Chambersburg Engineering Company of Chambersburg, Pa.; Bement, Miles & Co. and William Sellers & Co., Incorporated, of Philadelphia. Twenty riveters have also been divided among the same firms. Fifty punching machines were divided between the Hilles & Jones Company of Wilmington, Del., and the Long & Allstatter Company of Hamilton, Ohio. Twelve shears, capable of cutting plates 9 feet 2 inches wide and  $\frac{3}{4}$  inch thick, were also ordered from the same firms. Twelve heavy axle lathes were ordered from Manning, Maxwell & Moore of New York and two from Bement, Miles & Co. of Philadelphia. Three wheel borers were also ordered from Manning, Maxwell & Moore and two wheel presses will be made by Bement, Miles & Co. The Shaw Electric Crane Company of Muskegon, Mich., were awarded the contract for 16 electric cranes, each with a span of 70 feet and capable of lifting 15,000 pounds. Five batteries of boilers, with an aggregate capacity of 1400 horse-power, have been ordered from the Cahall Sales Department of Pittsburgh. All the machine tools will probably be completed and ready for installation upon the completion of the buildings.

The plant will be the most complete of its kind in the world and will have a daily capacity of 40 of the largest steel cars now being made. The company will probably receive their steel from the Homestead works of the Carnegie Steel Company, Limited, by boats, and facilities for taking it by rail will also be had. The buildings will be so arranged that material will be handled as little as possible. The designs are said to promise the most economical methods obtainable. It is the intention of the Pressed Steel Car Company to operate the present works in Lower Allegheny, and this plant, in connection with the new works at McKee's Rocks, Pa., will give the company an output of from 70 to 80 steel cars per day. As there are about 12 tons of plates and shapes to each car, it means a daily consumption of close to 1000 tons, all of which will be furnished by the Carnegie Steel Company, Limited, under the terms of the contract recently made between the two concerns. It is expected to have the works at McKee's Rocks in operation in about six months.

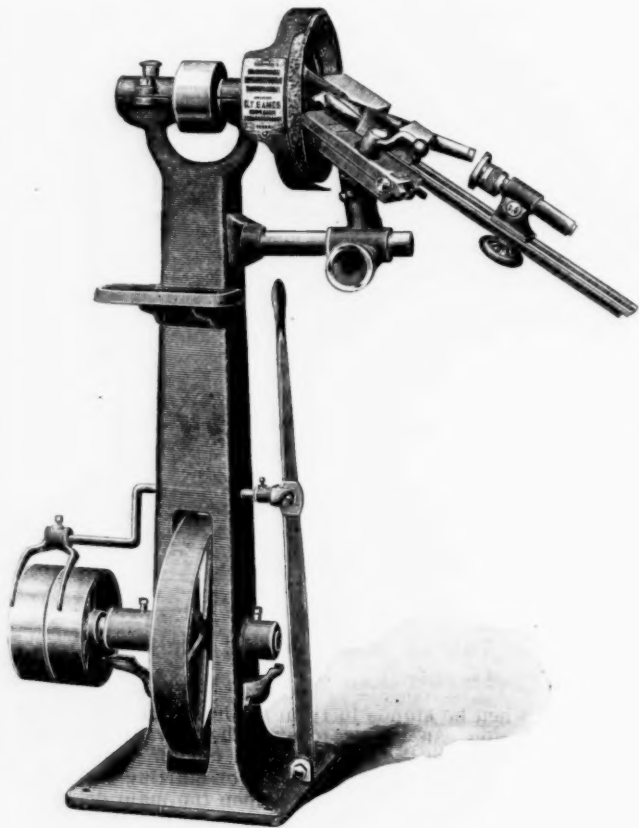
The factory of the New York Leather Belting Company, at Brooklyn, was partially destroyed by fire on February 16. The company, however, have such large stocks in their New York store and at branches that all orders can be promptly filled. The factory will be rebuilt at once.

Taking effect Tuesday, February 16, the rate of freight on pig iron, scrap iron and billets and articles taking same rates in carloads of 12 gross tons or over from Pittsburgh and points taking Pittsburgh rates, to Carey, Ohio, has been fixed at \$1.50 per ton on mill cinder and scale, \$1.50 per ton on pig iron and \$1.60 per ton on billets and scrap.

The co-partnership heretofore existing between George H. Chase and Walter Graham, Philadelphia, Pa., under the name of the Tidewater Coal Company, has been dissolved by mutual consent, and all claims and demands will be paid by George H. Chase, surviving partner. George H. Chase, having taken all business and contracts of the firm, will continue the same under the name of the Tidewater Coal Company.

## The Yankee Twist Drill Grinder.

American twist drills are to be found in all the workshops of the world, and to insure their efficiency the employment of an American machine for grinding them has proved to be highly desirable. The Yankee grinder has been brought out for this special purpose by the G. T. Eames Company of Kalamazoo, Mich. The manufacturers of this machine state that it is a well-known fact that while a twist drill can be hand ground so as to get a hole through iron, it cannot be thus ground mechanically correct, the pitch of the lips being certain to vary, and one lip will be longer than the other. Such a drill in cutting, therefore, only uses the longest lip, cutting but half as fast as it should. Neither is the point exactly in the center, and as the drill is bound to revolve around its point it is forced to scrub against the side of the hole it is boring, thus making it untrue to size and wearing the drill away and making it tapering toward its point. With a drill ground in this machine this trouble is avoided, the drill cuts quicker and with no squeaking or side friction, which, with the hand ground drill, spoils both hole and drill. The whole force



THE YANKEE TWIST DRILL GRINDER.

is applied at the cutting edges, and such a drill will run longer without regrinding than the other, and will also last several times as long before it is worn out. The adjustments on the machine are so quick as to be practically instantaneous. It requires no index, no figures or pointers are to be set, and no looking at the size of the drill is necessary. It is simply dropped into the adjusting groove, the lever is tightened and the machine is ready to grind. Should it be desired to vary the standard clearance the adjustment is equally quick. These features are most desirable and peculiar to this machine. The machine grinds flat or twist drills from  $\frac{1}{8}$  to  $2\frac{1}{4}$  inches and to any desired clearance. All parts are interchangeable, being made to standard gauges, insuring quick repairs.

The entire equipment of the Warwick Cycle Mfg. Company's plant at Springfield, Mass., has been bought by A. B. Pitkin Machinery Company, Providence, R. I. The plant includes 250 machine tools, many of which are nearly new, and comprise everything usually found in a first-class bicycle factory. The shop will be dismantled by the present owners and sold in lots to suit. The real estate and power plant, consisting of a three story building 325 x 52 feet, with L's, 25 horse-power power plant, modern electric light plant, hot water heating system, and sprinklers, is also offered for sale.

## Krupp Armor Plate.

WASHINGTON, February 28, 1899.—Throughout the debate in the House during the past week on the armor plate question there were numerous references to much valuable data concerning the development of the manufacture of armor plate, and especially of the advance made in the so-called Krupp process which had been furnished to the Naval Committee by the Bureau of Naval Ordnance. This information was contained in two interesting communications from Captain O'Neil, Chief of the Bureau, addressed in duplicate to Representative Boutelle, chairman of the House Committee, and Senator Hale, chairman of the Senate Committee. For special reasons this data was not made public during the debate in the House. Both letters have since been secured by the correspondent of *The Iron Age*, through the courtesy of Mr. Boutelle and Captain O'Neil, and are given below. They cover not only the progress made in the manufacture of so-called "improved Harvey" or Krupp armor, but also the extent to which these high grade plates are now being used by the navies of the world. Another interesting feature of these communications is the statement therein contained that the Midvale Steel Company have expressed their willingness to undertake the manufacture of armor plates of the highest quality.

The first letter addressed to the Naval Committees by Captain O'Neil was as follows:

Recent improvements in the manufacture of armor have developed a product superior in quality to that heretofore used. Up to the present time experimental plates only have been manufactured in this country, but their endurance at the proving ground has been such as to leave no doubt of the superiority of such armor over that at present or heretofore manufactured for service use.

The American armor making companies state that they are prepared to undertake the commercial manufacture of the new process armor, and to submit it to ballistic tests for acceptance 25 per cent. more severe than those now applied to the present service armor. They further state that the price of such armor would probably be \$545 per ton; that they were obliged to pay a large sum of money to acquire the process, and will have to pay a royalty of \$50 per ton on such as they may manufacture.

It is impossible for the Bureau to state whether the price named is excessive or not, as the process of manufacture is kept secret, but enough is known to lead the Bureau to suppose that the cost of making armor by the new process is not \$100 per ton greater than by the present process, as the principal difference lies in the composition of the metal and in the process of carburization prior to tempering. The same machinery is necessary for handling, forging, bending and machine finishing in either case; while in the new process one expensive feature is omitted—namely, re-forging after carburization. On the other hand, it may be stated that one of the indirect causes which would justify an increased cost is the reduction in output which would follow unless increased facilities are provided. Again, it must be admitted that it is due to the enterprise of the armor manufacturers in this country that they have acquired the process of improving armor.

The plea brought forward by the armor manufacturers for an advanced price is that if \$400 a ton is a proper price for the present quality of armor, 25 per cent. more money is a fair price for armor 25 per cent. better in quality, and that as the Government now agrees to pay the royalty for the use of the Harvey process, it should pay the royalty on the new process.

The armor manufacturers state that they would prefer to continue to make armor as at present, at present prices, than the new process armor at the price named.

From such information as the Bureau has been able to obtain, it learns that about £112 per ton (\$544.32 per ton) is being paid by other nations for the new process armor, except for plates of difficult shape, when more is expected.

The advantages to be derived from the use of such armor are obvious and need not be enlarged upon, it being sufficient to state that a 12-inch plate of the new process armor would be equivalent to a 15-inch plate of the quality now being used, thus affording equal protection on 25 per cent. less weight, or 25 per cent. greater protection with present weights.

As only a limited weight can be assigned for armor for hull and gun protection (23 per cent. of the displacement in the "Maine" class of vessels), it will readily be understood how essential it is that the best and most resisting armor obtainable should be procured, in order that the greatest possible area of the vessel may be well protected, especially the water line, machinery space and gun emplacements, within the limit of weight allowable for such purposes.

The maximum thickness of the side belt armor on the "Alabama" class is 16½ inches, whereas on the "Maine" class (the latest battle ships authorized) it is proposed to have a maximum thickness of 12 inches for the same armor, thus obtaining the same protection on about 25 per cent. less weight, and to utilize the weight thus saved by increasing the thickness of the casemate armor, which protects the 6-inch guns, to 7 inches, as against 5½ inches on the "Alabama" class, thus greatly improving the vessels of the "Maine" class, as regards the distribution of armor; this being upon the assumption that the new process armor will be supplied to the latter vessels.

The Russian battle ship of 12,700 tons displacement now being built at Cramps' shipyard is to carry the new process armor, one-half being supplied by the Carnegie and the other half by the Bethlehem Company, and these companies state that the price they are to receive for this armor is greater than that they would ask of this Government (that is, more than \$545 per ton).

At the present time there are four battle ships being built for the British Government, in England—namely, "Vengeance," "Canopus," "Albion" and "Glory;" also four battle ships for the Japanese Government, and four armored cruisers for the British Government, and three for Japan. In addition to the above vessels, all of which it is understood are to be supplied with the new process armor, the British Admiralty has asked for tenders for four battle ships and two large armored cruisers, all of which will have armor similar to that to be provided for the other ships referred to above.

The special features which characterize the new process armor are its depth of hard face, extreme toughness of back, and its ability to resist numerous impacts at high velocity without perforation or cracks to a marked degree as compared with the present service armor.

As the Department is aware, no contracts have yet been made for armor for battle ships "Maine," "Missouri" and "Ohio," or for harbor defense monitors "Arkansas," "Connecticut," "Florida" and "Wyoming."

The above named vessels have been contracted for, and it is essential that contracts for their armor should be made immediately after the beginning of the fiscal year commencing July 1, 1899, which will be about seven or eight months after the date of contracts for their hulls and machinery.

It will be remembered that in the case of the "Illinois," "Alabama" and "Wisconsin" contracts for their armor were not made until one year and nine months had elapsed after the vessels were contracted for, thus greatly embarrassing the Department and the shipbuilders, and rendering it impossible to complete the vessels as soon as might otherwise have been the case.

It is estimated that 2697 tons of armor will be required for each of the three vessels of the "Maine" class, and 545 tons for each of the four harbor defense monitors, or a total of 10,271 tons for the seven vessels. At the present price of \$411.20 per ton (including royalty), 10,271 tons of armor would cost \$4,223,435.20, and at \$545 per ton the cost would be \$5,597,695, or \$1,374,259.80 more for the new process armor than for the old; but the vessels will receive 25 per cent. better protection.

Under date of December 2, 1898, the Midvale Steel Company of Philadelphia addressed a letter to the Department, stating that they desired to be put on record as offering to furnish armor equal to that now being furnished, or equal to that furnished by any new process, at a price less than that which the Department is now paying. Up to this date the Midvale Steel Company have not manufactured any armor plate and have not the necessary facilities for so doing, nor is it probable that the company have the requisite practical experience and knowledge to enable them to at once enter upon the successful manufacture of armor on a large scale. Much preliminary and experimental work is necessary to such an end, and should this company at once proceed to enlarge their facilities by ordering the necessary machinery, erecting buildings, &c., it is more than doubtful if they could get ready to commence work on the manufacture of armor in time to be in a position to bid on contracts for the vessels now under construction, unless, perhaps, for a comparatively small quantity of the lighter class of plates. Hence the Bureau is of the opinion that most of the armor required will have to be ordered from the same sources as heretofore.

The Bureau ventures to express the opinion that it is not expedient to fix by law the price which may be paid for armor, but that it may safely be left to the Department to guard the interests of the Government in this as in the purchases of other material.

The new process armor is referred to as the improved Harvey, and sometimes as that made by the Krupp process.

The Bureau respectfully recommends that in the next



appropriation bill providing funds for the increase of the navy no restriction be placed upon the cost of armor, but that the matter be left to the Department to make the best terms it can. If this is not done, there is danger that a serious delay will be caused, which is likely to result in much embarrassment to the Department, and out of which complications and claims for damages for delays, on the part of the shipbuilders, will arise and the completion of the vessels be retarded.

The Department can take but one attitude in this matter, which is that the vessels of the United States Navy must be the equals of any in the world in all respects; that they must carry the best armor that can be procured, regardless of cost, in order that their prestige and efficiency may not be impaired, and that they shall not suffer by comparison with the latest vessels of other powers.

While the armor manufacturers have intimated that the cost of the new process armor would be \$545 per ton, it is by no means certain that they will specify that sum in their bids, especially if they have reason to believe that there will be any competition, or if they know that the Department can, if it chooses, establish an armor factory. The sum named by them is undoubtedly the maximum price they expect to ask. Hence it might be well to insert a proviso in the appropriation bill to the effect that if the Secretary of the Navy is unable to make satisfactory terms as to the cost of armor, he is authorized to proceed at once with the establishment of a Government armor factory, and the necessary funds are made available for this purpose.

Following the above communication the Senate gave a hearing to Captain O'Neil and Secretary Long in an executive session of the Naval Committee. Subsequently, under date of February 22, 1899, Captain O'Neil furnished the committee with the results of more recent investigations, including some interesting and important data as to the adoption of Krupp armor by the leading European nations. Captain O'Neil said:

On February 2, 1899, in company with the Secretary of the Navy, I appeared before the Senate Naval Committee, for the purpose of furnishing information with reference to armor made by the so-called Krupp process, about which several notices have appeared in technical and military journals and in the daily prints; your committee desiring full information as to whether armor made by such process could be utilized for battle ships "Illinois," "Alabama" and "Wisconsin."

In my remarks on that occasion, I stated that from the best information obtainable it was learned that experimental plates only, made by the Krupp process, had been presented; that up to that time it had not been introduced into service, unless, perhaps, in the exceptional case of the Russian battle ship "Poltava," for which Krupp made the armor, which cost \$542.64 per ton, delivered in St. Petersburg. Nothing is known as to the ballistic requirements pertaining to that contract, but it is understood that Krupp received his order on account of the good showing of his 11.8-inch trial plate, which was tested at Meppen on September 15, 1895. I further stated to your committee that while the American armor manufacturers had acquired the Krupp process and the right to use it on payment of a sum in the nature of a royalty (which they now claim is \$45 per ton), they were then unable to say when they would be able to submit experimental plates for test, and consequently they could not undertake its manufacture, or in fact the manufacture of any armor of higher ballistic qualities than the nickel steel face hardened armor they were then furnishing the Government. It therefore became necessary to order for the "Illinois," "Alabama" and "Wisconsin" armor made under practically the same specifications as was that for the two preceding battle ships—namely, the "Kearsarge" and "Kentucky." It may be said, however, as a matter of certainty that the armor contracted for, for the five foregoing vessels, represented the best state of the art of manufacture at the time the contracts were made, and that its quality is equal to the best supplied by any nation for its contemporaneous vessels.

During the past year the manufacture of armor made by the so-called Krupp process (which is sometimes referred to as the improved Harvey) has passed the experimental stage, and is being manufactured commercially on a large scale abroad and on a moderate scale in the United States. In this country the Carnegie Company presented for test at the Naval Proving Ground at Indian Head, in July, 1898, a 6-inch Krupp plate, and in October of the same year a 12-inch plate made by the same process, and while these were their first efforts and naturally not as good as may be expected when greater experience is had in manufacture, they showed marked qualities of excellence and of superiority to the ordinary face hardened armor.

In November, 1898, the Bethlehem Company gave a test at their proving ground, at Reddington, Pa., of a 6-inch experimental Krupp plate, which was witnessed

by an officer from the Bureau of Ordnance. This plate was attacked with 8-inch armor piercing projectiles, and withstood six shots, having a total energy of 30,668 foot tons, but one of the projectiles getting through the plate and backing, and that one being entirely broken up. This projectile struck with a velocity that should have carried it through 13 inches of wrought iron or through nearly 8 inches of ordinary face hardened armor. This plate undoubtedly made as good showing as any plate of its size and thickness ever presented for test. These results were so conclusive that the two American companies referred to announced that they were prepared to manufacture Krupp armor commercially, and would submit such armor to a ballistic test 25 per cent. more severe than that now required; and in the latter part of last year they contracted to furnish Krupp armor for a Russian battle ship, now being built at the Cramps' works in Philadelphia; the tests for this armor are severe, and are to be made at Indian Head by the Navy Department as a matter of courtesy to the Russian Government (which pays all costs of the same).

The peculiar qualities of the Krupp armor are its depth and hardness of face; extreme toughness of back and immunity from cracks under numerous heavy impacts.

The process of manufacture is not patented, but is a so-called trade secret, though it is not wholly so. The chemical composition of Krupp plates is known to be practically as follows:

	Per cent.
Nickel, not less than.....	3.5
Chromium, not less than.....	1.3
Carbon, not less than.....	0.2
Manganese, not more than.....	0.4
Copper, not more than.....	0.07
Phosphorus, not more than.....	0.03
Sulphur, not more than.....	0.03
Silicon, not more than.....	0.05 to 0.15

The above formula differs but little from that which governs the manufacture of the ordinary nickel steel armor as now made, there being a slight difference in the percentage of nickel—namely, 3.5 per cent. as against 3.25 per cent. now used by us, and the addition of chromium to the extent of 1.3 per cent., which we do not employ. One of the features of chromium is that it possesses the property of keeping carbon in the form of "hardening carbon;" another is that it raises the limit of saturation for carbon, and therefore its presence undoubtedly greatly facilitates the process of carburization, which has to be performed prior to tempering. The hardening of chromium steel is much more difficult than of ordinary steel; it is liable to crack during the process, thus necessitating the use of oil as a cooling medium, whereas the ordinary nickel steel armor is water tempered. The process of carburization, which is accomplished in the Harvey process by charcoal under a high and prolonged heat, is accomplished by means of a hydrocarbon gas in the case of the Krupp plates, and requires furnaces specially adapted for the purpose.

Krupp armor being excessively tough, requires a longer time in the machine shop to cut and grind its edges to final dimensions and to drill for bolts, &c.

As regards the cost of manufacture, but little can be said, except by those engaged in the business. They claim that their output is smaller and that the risks of losses are greater with Krupp than with the ordinary armor, and that they are under agreement to pay \$45 per ton as royalty. Both the American armor companies have informed the Bureau of Ordnance, in writing, that the lowest price for which they will undertake the manufacture of Krupp armor is \$545 per ton, including royalty. They argue that if \$400 (with royalty for face hardening process) is a fair price per ton for the present quality of armor, \$500 per ton is a fair price for armor 25 per cent. more resisting in quality, the Government paying the royalty in either case, and that this price is less than they are now receiving for the armor for the Russian battle ship, and is less than is being paid abroad.

So far as concerns the adoption of Krupp armor abroad, I have positive information from one of the largest manufacturers of armor in Great Britain, who has large contracts for the British and foreign Governments, that they are making nothing but Krupp armor; and it is understood that in England alone the following vessels are being supplied, or are to be supplied, with this quality of armor: For the British Government, four battle ships—namely, the "Vengeance," "Canopus," "Albion" and "Glory;" also four armored cruisers. For the Japanese Government, four battle ships and three armored cruisers. In addition to the above the British Admiralty has asked for tenders for four battle ships and two large armored cruisers, all of which are to have armor of similar quality. Russia, Germany and France are also using Krupp armor.

The question is frequently asked, Whether because a better quality of armor is used, less in weight will be needed? and the reply is, Not to any material extent, because it is recognized that armored vessels should be



given the best—that is, the greatest amount of—protection which their displacement warrants. A certain percentage of the displacement in all armored vessels is allowed for the weight of hull and machinery; for coal, for equipage and for armament and ammunition, stores, &c.; and for hull and gun protection: the latter is 25 per cent. in the new "Maine" class—that is, 25 per cent. of 12,500 tons, or about 3100 tons for protection; and while this weight might be considerably reduced and still leave the vessels relatively as well protected as their predecessors having ordinary nickel steel face hardened armor, it would not be practicable to make an all round deduction of 25 per cent. in weight, as it would only be practicable to reduce the heavy plates in thickness. The thin plates—that is, those of about 6 inches, would not have sufficient mass to resist a heavy impact, no matter how good they were, if they were materially reduced.

What is expected to be gained by the use of Krupp armor is better protection on the same weight than is now allowed, and by a different distribution of armor to cover a larger area of the vessel, by reducing the thickness of the very heavy belt, diagonal, barbettes and turret armor and applying the heavy plates thus saved to hitherto unprotected portions of the vessels, and by thickening up those parts which from necessity have heretofore been comparatively lightly protected—namely, the casemates and superstructure, in which the rapid firing guns are placed.

As regards the price now being paid abroad for Krupp armor, I have positive information from one of the principal British armor making establishments, which now have large domestic and foreign orders, that they are not selling it to anybody for less than £117 (\$568.62) per ton. Whatever the price, the Navy Department can take but one attitude—namely, that the best and only the best armor should be supplied to United States vessels, and in order that their prestige may be maintained and that they may be in all respects the equals of the ships of war of the other nations.

W. L. C.

### A New Steel Plant at Youngstown.

(By Telegraph.)

PITTSBURGH, Pa., March 1, 1899.—With the taking over of the plants of the Ohio Steel Company and the Union Iron & Steel Company at Youngstown by the National Steel Company, and the probability that four blast furnaces will be built at Youngstown instead of two, the furnaces in the two valleys have again taken up the question of building a steel plant. The project has not assumed tangible shape by any means, but is being discussed, and it is not improbable that some of the best equipped blast furnaces in the two valleys will go together and build a steel plant, with an output of not less than 2000 tons per day. The need of another valley steel plant is recognized, and with the ore and coke properties owned by some of the furnaces it is believed a plant could be erected that could compete with the strong National Steel Company and be a profitable investment.

### The Naval Appropriations.

WASHINGTON, February 28, 1899.—(Later.)—The Senate Committee on Appropriations late this evening reported to the Senate the naval appropriation bill. The modifications of the measure of chief interest are found under the head of "The Increase of the Navy." The Senate Committee has reduced the three battle ships to two, the three armored cruisers to two and the six protected cruisers to four, providing for a total of eight vessels instead of the 12 authorized by the House. The Senate Committee also restored the provision originally incorporated in the bill by the House Committee, but struck out on the floor, prohibiting any one ship yard or firm from constructing more than two of the battle ships or armored cruisers. In the bill as passed by the House it was provided that one battle ship and one armored cruiser should be constructed on the Pacific Coast, but the Senate amended this provision, requiring that but a single ship shall be built on the Pacific Coast. The House amendment reducing the cost of armor plate from \$545 to \$445 per ton was accepted by the Senate Committee.

W. L. C.

**The Roebling Mill Not Sold.**—Reports have been given wide currency during the past few days that the plant and property of John A. Roebling's Sons Company at Trenton, N. J., had been sold to the American Steel & Wire Company of New Jersey. We are officially advised that there is no truth in these statements and that there are not any

negotiations of any kind pending for either the sale or the purchase of the property.

## The National Steel Company.

We have in the past fully reported the details relative to the National Steel Company, who have now been formally organized with the following officers:

**PRESIDENT:** W. E. Reis of New Castle, Pa. Mr. Reis has been president of the Shenango Valley Steel Company and has been prominently identified with the progress of the steel and allied industries of the Shenango Valley.

**VICE-PRESIDENTS:** Henry Wick of Youngstown, Ohio, and R. M. Gilbert, Columbus, Ohio. Mr. Wick has been a prominent figure in the Mahoning Valley for many years. He has been president of the Ohio Steel Company since their organization, and has been connected with the Union Iron & Steel Company and other concerns. R. M. Gilbert has been president of King, Gilbert & Warner, who have been operating blast furnaces and a successful steel plant at Columbus, Ohio.

**SECRETARY AND AUDITOR:** William H. Baldwin of Youngstown, Ohio. Mr. Baldwin has been secretary of the Ohio Steel Company since their organization.

**TREASURER:** F. S. Wheeler, Chicago, Ill.

#### DIRECTORS:

W. E. Reis, New Castle, Pa.  
Henry Wick, Youngstown, Ohio.  
Myron C. Wick, Youngstown, Ohio.  
R. M. Gilbert, Columbus, Ohio.  
A. B. Carter, Bellaire, Ohio.  
James McLain, New York.  
D. G. Reid, Chicago.  
Warner Arms, Chicago.  
W. B. Leeds, Chicago.  
W. T. Graham, Chicago.  
W. H. Moore, Chicago.  
J. H. Moore, Chicago.  
John Topping, Wheeling, W. Va.  
James B. Hill, New York.  
F. S. Wheeler, Chicago.

Myron C. Wick has been president of the Union Iron & Steel Company, and is largely identified with Mahoning Valley interests. A. B. Carter has been connected with the Bellaire Steel Company. James McLain is a member of the firm of Phelps, Dodge & Co. of New York. D. G. Reid was formerly treasurer of the American Tin Plate Company of Elwood, Ind. W. B. Leeds was president of the same concern. W. T. Graham was formerly president of the Aetna-Standard Iron & Steel Company, but joined the American Tin Plate Company, and was succeeded by John A. Topping, formerly the secretary. W. H. Moore and J. H. Moore are the promoters of the American Tin Plate Company, with whom F. S. Wheeler is also connected.

#### EXECUTIVE COMMITTEE:

W. E. Reis.  
W. H. Moore.  
R. M. Gilbert.  
Henry Wick.  
D. G. Reid.  
W. B. Leeds.  
F. S. Wheeler.

The capital stock consists of \$27,000,000 of 7 per cent cumulative preferred and \$32,000,000 of common. Both preferred and common stock shall have equal voting powers. The preference shares are also preferred as to assets in the event of liquidation. The charter, which was drawn by James B. Dill, contains the following provisions: The corporation shall not be at liberty, without the consent in writing first obtained of the holders of two-thirds in amount of the preferred stock issued and outstanding—

a. To create or issue any other or further shares ranking in any respect *pari passu* with or in priority to the aforesaid issue of \$27,000,000 of preference shares;

b. Nor to create any charge, except as herein provided, upon the net profits of the corporation which shall not be subordinate to the rights of the preference shares;

c. Nor to reserve a surplus fund which shall not be chargeable with the payment of the accrued dividends on the preference shares.

A report has been published in the daily press to the effect that the Federal Steel Company had purchased the property of the Jackson & Woodin Mfg. Company of Berwick, Pa. This inaccurate statement probably grew out of a misunderstanding. It is the American Car & Foundry Company which assumed control of the business and the plant of the Jackson & Woodin Mfg. Company on the 1st inst.

The H. H. Franklin Mfg. Company of Syracuse, N. Y., manufacturers of finished castings, have removed to 208 to 214 South Geddes street.

# The Iron Age.

New York, Thursday, March 2, 1899.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
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RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

## Do We Need Colonies to Help Our Trade?

However England and Canada may look upon the results of the legislation enacted by the colonial government for preferential tariff rates in favor of the mother country, the United States have no cause to complain. The Canadian tariff of 1897 was a step in the direction of that form of imperial federation which many British subjects have favored as a barrier against the competition of non-British trade. But in spite of the discrimination against the United States, our trade with Canada has grown steadily. In 1897, the year in which the new law was enacted, our exports to that country were 16 per cent. larger than in the preceding year. In 1898, when the compact with Great Britain went into full effect, our exports to the Dominion increased over those for 1897 by 24 per cent. Thus it appears that preferential tariff rates are no more effective than were the sentiments of attachment felt by the Canadians for the mother country in preventing the purchase elsewhere of whatever goods they need, particularly when they are of a better quality or lower in price than goods made beyond the sea. It remains to be seen whether the preponderance of imports from the United States will be disturbed by the opening of the heavily subsidized Canadian mail line across the Atlantic which has been provided for.

This illustration of the difficulty on the part of a leading commercial power to control the trade of one of its colonies ought to have weight with those of our people who advocate the holding of the Philippine Islands by the United States on the ground that a new field for trade would thus be opened to us. Other countries have created colonies, established protectorates, and made dependencies of weak States, in order to make new customers for their surplus products, or that their citizens might enjoy a monopoly in trading in the products of the colonies. Hence, it is asked, why should not we do the same thing when the opportunity is offered? Another purpose of colonization has been to afford an outlet for the congested populations of the Old World, but such a need is not likely to confront the United States for a long time to come. It may be observed, however, that Great Britain's most successful work in colonization has been in cases where the new possessions have become peopled with English stock. But even where the Briton takes root and thrives, he is not committed thereby to the productions of his native country. Great Britain leads the world in the number of her colonies and dependencies, but almost without exception her relative share in the trade of these colonies is decreasing. Mr. Chamberlain, of the Colonial office, has given his people a rather rude awakening by collecting samples of all manner of goods consumed in Her Majesty's colonies, but not manufactured within her realm. The colonists have learned where they can buy some things cheaper than in the mother country, and if their trade is to be retained, British prices must come down. Let foreign competitors undersell her own manufacturers, quality for quality, and Great Britain's

48 colonies soon will be worth no more to her than if they belonged to Persia or Siam. It will thus be seen that the mere possession of colonies is not necessarily desirable.

One of our Government bureaus has published an extensive report on the "Colonial Systems of the World," showing that an important percentage of the earth's surface exists under colonial governments, together with about a third of the world's entire population. The fact is emphasized that these numerous colonies and dependencies have a trade amounting to over \$3,000,000,000 a year, of which more than 40 per cent. is carried on with the mother countries. But considering how such countries as France discourage all foreign commerce with their colonies, and how the English have fostered the imperial federation idea, 40 per cent. of the whole of the export and import trade of the world's colonies does not seem a very large share for the mother countries. Yet it seems likely to decrease before it becomes larger. From the same report it appears that in ten years the share of Australia's total imports supplied by Great Britain has declined from 49 to 40 per cent.; that for South Africa has declined from 81 to 71 per cent., and that for Canada from 38 to 28 per cent. Evidently the trade of the colonies, no less than that of self governing States, belongs to the country that can offer the best terms, whether in buying or in selling, for which reason the United States have no reason to incur heavy new and untried responsibilities in order to secure new markets. How much better the new markets gained in Japan, to which country our exports have doubled in three years, or in Australia, where they have doubled in four years, without the slightest responsibility on our part beyond delivering goods according to contract, than markets gained by assuming the care of millions of ignorant people who have yet to learn the uses of the simplest manufactured articles.

Another point attempted to be made in this publication is that the colonies of the world, on the whole, are self-supporting—i.e., they do not burden the mother countries. It is true that the British colonies, including India, showed last year an aggregate of revenues over expenditures of \$4,000,000, but this must have been more than offset by expenses of the home government growing out of the colonial system. Besides, these British colonies have public debts amounting to \$2,821,785,195. The other European powers have not done so well. How her oversea possessions brought ruin to Spain, the whole world has been made aware. No doubt the people of France and Germany would be appalled were they to realize once the actual cost of their colonial enterprises. France has 32 colonies and dependencies, ten of which last year cost the home government \$11,600,000 in addition to their local revenues, and all the others doubtless failed to make both ends meet. To this add the cost of supervision of the colonial system and a share of the bounties for shipping and the postal subsidies—and for what? France imported from all her colonies goods worth \$21,000,000, and exported to them goods worth \$18,237,600, part of which trade doubtless would have fallen to her in any event.

To discuss the political and military features of the Philippine question is outside of our province. But looking at its commercial aspect alone, it ought to be plain that if colonies which have long been in undisputed control of the most powerful nations in Europe have not yet been brought to a profitable condition, it would not be surprising if our experience with a colony in the far East, with a turbulent people whose



characteristics we have yet to learn, should fail to show a balance on the right side of the ledger for many years to come. Meanwhile, the degree of energy and effort required to maintain our authority over these remote islands might, if devoted to export trade in more promising fields, do much to make our goods known in markets where the people are prepared already to buy, and where they do not need to wait to learn to wear clothes, to say nothing of learning to use iron and steel, hardware and tools, engines and machinery.

### Volume and Velocity of Circulation.

Since the revival of business has been accompanied by an increase in the volume of the currency, a good many business men give credit for it in a very exaggerated degree to that increase. The truth is that the greater amount of money is, at least in part, due to the greater activity of business, and while the bank clearings have risen and fallen in rough accord with the state of trade, the amount of money in circulation has often moved in an opposite direction.

For example, in 1892 and in 1895 the amount of money in circulation, as indicated by the Treasury statements, was practically identical. Yet the bank clearings were \$9,000,000,000 more in 1892 than in 1895. In 1894 the volume of money in circulation was nearly 4 per cent. greater than in 1892, yet the bank clearings were 27 per cent. less. The year 1892 was an exceptionally prosperous year, and 1894, with an increase of circulation, was a year of profound depression.

Of course all payments do not go through the Clearing House, but it is a reasonable assumption that so large a part of them do that the movement of the bank clearings indicates the course of trade. In 1892 the clearings were nearly 39 times the volume of circulation. In 1894, with an increase in the amount of circulation, the clearings were only 27 times the amount of circulation. In 1896 the circulation had declined nearly 10 per cent., but the bank clearings increased \$6,000,000,000, and amounted to 33 times the volume of circulation. In 1898 the volume of currency was one-fifth greater than in 1896, but the volume of clearings was one-third greater, and was 37 times the amount of the circulation.

The increased demand for our agricultural products, at increased prices, gave this country an increase of real wealth, of gold either sent to this country or held in Europe subject to American orders or of securities sent to this country. Of course this added wealth increased the ability and disposition to buy and invest. The disposition was also increased by various political and economic conditions that created in men's minds the opinion that the standard of value would not be reduced and that business would continue for some time to be active and profitable. The increased willingness and ability to buy led to an increase of deposits and an increased ability and disposition on the part of the banks to lend. In two years the increase in net deposits in the banks of New York alone has been \$324,000,000, which is a good deal more than the total increase in the money in circulation in the country between February, 1897, and February, 1899.

The increased supply of money is due far more to the increased ability and willingness of capitalists to buy and invest than to the increased manufacture of currency by the Government. The increased amount

of money in the country due to Europe's immense remittances was an actual increase in the wealth of the United States. Neither the issue of paper by the Government nor the change in the form of the silver in the Treasury from bars into coins would have increased wealth, and therefore neither could have had the same effect upon the condition of business in the United States that the European remittances had. But the increasing sense of confidence since 1896 that the unit with which values are measured would not be tampered with has had quite as much as anything else to do with the willingness of men to circulate the money that they have.

Last Monday an important decision was handed down by Supreme Court Justice Smith awarding to Benjamin F. Forbell, a market gardener of Queens County, \$6000 damages in his suit against the city of New York, and also enjoining the city from operating a pumping station at Spring Creek, which forms part of the Brooklyn water supply system. Mr. Forbell owns a farm about 2000 feet from the station. He stated that since the introduction of the pumping station he has lost \$4000 or \$5000 yearly, because it has drained the water from his land. The station pumps its water from a series of wells sunk so as to tap the underground flow. The evidence satisfied the judge that the operation of the station lowered the water level under the farm several feet. The effect of this was to prevent the owner from growing those crops to which the land was peculiarly adapted, and from which he had previously made a large profit. The judge says: "The property right in waters which flow upon the surface of the ground is no more sacred than property rights in water that flows underground. There can be no escape from the conclusion that the acts of the defendant were injurious to the plaintiff, and that an action will lie for the damages he has sustained by reason thereof." Water works of this description are common throughout the country, and the decision is, therefore, one of wide bearing.

### OBITUARY.

LEWIS MILLER.

Lewis Miller of Akron, Ohio, one of the pioneer inventors and manufacturers of agricultural implements, died on February 17 at the Post-Graduate Hospital, New York City, from exhaustion following a surgical operation. Mr. Miller had been ill about two weeks and his attending physician at Akron decided that an operation was necessary to save his life. He was born in Greentown, Ohio, in 1829. In early life he learned the machinist trade, and started a shop in Canton. He at once took up the invention of agricultural machinery, and was one of the first persons to produce a practical reaping and binding machine. He also invented mowing and threshing machines, and his whole business life was devoted to the manufacture and improvement of these machines. He was connected with three plants. They are those of C. Aultman & Co. of Canton, Aultman, Miller & Co. of Akron, and Aultman, Miller & Co. of Mansfield. Mr. Miller gave his personal attention to the Akron plant. Mr. Miller was widely known outside of business circles in connection with his wide charities and his active interest in charitable, educational and religious matters. He was one of the founders in 1874 of the Chautauqua Assembly, which has since become famous.

JOHN A. EMERICK.

John Adams Emerick, a former manufacturer of foundry facings and supplies, and well known in the iron and steel trade of Eastern Pennsylvania, died on February 15 at his home at Langhorne, Bucks County, Pa., aged 71 years. He was born at Hudson, N. Y., and went to Philadelphia when 19 years of age, where he became a skilled mechanic. In 1858 he established the then new business of separately manufacturing foundry facings and supplies,



continuing in that business until six years ago, when he retired, and his mills at Beach and Shackamaxon streets, Philadelphia, passed to other ownership. Mr. Emerick was at one time president of the Eureka Cast Steel Company of Chester, Pa.

DAVID BRADLEY.

The death of David Bradley, president of the David Bradley Mfg. Company of Chicago, Ill., and founder of the town of Bradley in the same State, occurred on February 19 at his home in Chicago, from old age. Mr. Bradley was born in Groton, N. Y., in 1812. Early in life his parents moved to Syracuse, and there he learned the trade of a maker of plows. In 1835 he settled in Chicago and established the first foundry ever created in the city, and was the first man to ship into Chicago a bar of pig iron. Later he established a small factory for the manufacture of plows. He was the pioneer maker in the West of this agricultural implement, and his business increased rapidly. Mr. Bradley added constantly to the size of his plant for a period of 50 years. At that time, in spite of his burden of years, his ambition to see the company bearing his name occupy a leading position led him to move his works from Chicago and to establish the manufacturing town of Bradley, now a thriving village.

ALEXANDER R. M HENRY, JR.

Alexander R. McHenry, Jr., for many years the representative in New York City of Davis & Thomas, iron manufacturers of Catasauqua, Pa., died suddenly in New York on February 15, aged 45 years.

DAVID S. JENKINS.

David S. Jenkins, former president and treasurer of the Jenkins Machine Company, Sheboygan, Wis., died suddenly on February 14, after a brief illness, at his home in that city. He was born in Wales in 1834 and came to this country with his parents in 1842, settling in Utica, N. Y. Two years later they removed to Sheboygan, where Mr. Jenkins lived for the best part of 53 years. As a boy he showed an aptitude for mechanics and at the age of 13 ran an engine in a saw mill. Later he went to Milwaukee and learned the machinists' trade. After a short experience as a steamboat engineer he returned to Sheboygan and engaged as a railroad engineer, running the first steam locomotive ever used in Wisconsin. After leaving the railroad service he took charge of the machinery of the Crocker & Bliss Chair Company, Sheboygan. In 1876, with his son DeWitt, he opened a machine shop of his own, which prospered to such an extent that in 1887 the Jenkins Machine Company were formed, with a capital of \$70,000 and an equipment equal to that of any machine shop in the State. Mr. Jenkins was president and treasurer of the concern, from which he retired two years ago. He was one of the oldest and most influential citizens of Sheboygan.

D. B. CURLL.

D. B. Curll of Clarion, Pa., and formerly a prominent business man of Pittsburgh, died February 19, at the home of his son, H. V. Curll, in the last named city, in his eighty-sixth year. Mr. Curll was born in Clarion County, Pa., and engaged in active business at the age of 14. He was interested in the furnace business with Curll, Pritner & Co., Hahn, Wagoner & Curll and Leeper & Co., and in the mercantile business with D. B. & H. V. Curll. He was one of the promoters of the Pittsburgh & Virginia Coal and Coke Company of Fairmount, W. Va., and also at one time controlled large oil interests.

JOHN KREUSI.

John Kreusi, chief mechanical engineer of the General Electric Company, died at Schenectady, N. Y., on February 22, at the age of 56 years. He was born in Switzerland and came to this country in 1870, entering the employ of Thomas A. Edison, at Menlo Park, N. J., under whom he constructed the first phonograph ever made. Mr. Kreusi, who was well known as a mechanical engineer, was the inventor and perfecter of the underground tubing system now in general use.

EDWIN S. CARPENTER.

Edwin Stanton Carpenter, assistant treasurer of the Westinghouse Electric & Manufacturing Company of Pittsburgh, died suddenly in New York city, on February 16. He had been for many years connected with the Westinghouse Company.

GEORGE L. NEWCOMBE.

George Loring Newcombe, one of the oldest and most respected citizens and business men of Salem, Mass., died on February 18, at the age of 87 years. He was born in Salem and learned the trade of a machinist in the steam boiler and engine works of Increase S. Hill. In 1838 he established himself in business in South Salem and began the manufacture of shafting and

hydraulic presses. In 1841 he made his first steam engine and soon extended this branch of manufacture, adding to it that of special machinery. Mr. Newcombe retired from business in 1872, and was succeeded by his son, George Newcombe.

A. L. CONGER.

Col. A. L. Conger, Des Moines, Iowa, died on February 25 from a stroke of paralysis, at the age of 70. He went to Des Moines a year ago from Akron, Ohio, and established a college of osteopathy. He was at one time president of the Whitman & Barnes Mfg. Company; president of the Akron Forge Company, director of the Diamond Match Works, Akron Water Works, &c., but met with serious reverses a few years since and became bankrupt.

## PERSONAL.

Philip D. Armour, the great Chicago packer, has given the Armour Institute in his city real estate and securities valued at \$750,000, which will be partly used to establish a complete course in civil engineering in that institution. Its equipment in mechanical and electrical engineering is of the highest character.

The report that H. M. Curry had resigned from the board of managers of the Carnegie Steel Company, Limited, of Pittsburgh, and would be succeeded by James Gayley is, we are advised, untrue. Mr. Curry is at present sojourning in California for the benefit of his health.

C. A. Meissner of Londonderry, N. S., has recently suffered the loss of many valued articles through the burning of his home.

Guy R. Johnson, who has been the general manager of the Embreeville Iron Company, Limited, of Embreeville, Tenn., has been appointed superintendent of the two furnaces which the Ohio Steel Company are now building at Youngstown, Ohio, and which are to be the largest in the world.

Clark Thurston, vice-president of the American Screw Company of Providence, R. I., has been appointed president and general manager in place of former President Angell, who has retired.

C. R. Brown, for several years connected with the sales department of the Illinois Steel Company and more recently with the Pratt & Letchworth Company, Buffalo, is now manager of the railway department of the Michigan Malleable Iron Company, Detroit.

Geo. H. Wightman, general sales agent of the Carnegie Steel Company, Limited, of Pittsburgh, who has been ill for some time, is rapidly convalescing. Mr. Wightman left the offices on January 3 and has spent the intervening time in the South recuperating, but has so far recovered his health that he expects to resume his duties in Pittsburgh this week.

Chas. McDonald, formerly in the converting department of the Duquesne Steel Works, has been made superintendent of the Bessemer department, to succeed Levi T. Upton, who resigned.

Jos. D. Fraser, superintendent of the Nova Scotia Steel Company, Limited, of Ferrona, N. S., was a visitor in Pittsburgh this week, going from there to Birmingham, Ala.

Sherard O. Cowper-Coles has been awarded by the British Society of Engineers the Bessemer premium for his paper on "Protective Metallic Coatings for Iron and Steel."

L. T. Upton, formerly superintendent of the converting department of the Duquesne Steel Works of the Carnegie Steel Company, Limited, of Duquesne, Pa., has resigned his position. Mr. Upton states he has been with the Carnegie Steel Company for 23 years.

Jas. Horton of Cleveland has been appointed superintendent of construction of the new 48-inch mill now being erected at the Homestead Steel Works of the Carnegie Steel Company, Limited. Jno. Shaldick has been engaged to superintend the construction of the two new plate mills.

E. C. Lynde, superintendent of the South steel mill of the Lackawanna Iron & Steel Company, Scranton, Pa., has been transferred to the North steel plant to serve as superintendent of that works. Geo. Barnard succeeds Mr. Lynde.

L. T. Pearson of the Beeston Foundry Company at Beeston, England, was in Pittsburgh last week to purchase radiators and steam heating fixtures for shipment to England.

W. P. Parsons, superintendent of the by-product gas and coke plant at Glassport, Pa., has resigned his position and has been succeeded by John Nicol.

S. S. Knight has been appointed to take charge of the chemical laboratory of the Addyston Pipe & Steel Company, Cincinnati, Ohio.

George M. Clark, for several years treasurer of the Mitchell & Tranter Rolling Mill Company, Covington, Ky., has purchased the entire interest in the plant, which he will operate and control hereafter himself. The plant is to be remodeled and improved.

James E. Hubbert of Hubbert & Hubbert, manufacturers' agents, of Chicago, has been elected vice-president and a director of the Corning Steel Company, Hammond, Ind.

## MANUFACTURING.

### Iron and Steel.

The Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, recently made a small shipment of mine rails to Japan.

The Reading Iron Company, Reading, Pa., have made a voluntary advance in wages of all their employees, dating from March 1. The percentage has not yet been determined upon, but the advances will apply to all departments of the company, varying in accord with the market conditions attaching to their various products, and will affect between 3000 and 4000 employees.

The Glasgow Iron Company, Pottstown, Pa., have given their puddlers a voluntary advance in wages. This concern at present are operating 22 double puddling furnaces and are contemplating starting up another mill at an early day with eight more.

Pickands, Mather & Co. of Cleveland, Ohio, who recently purchased Ella Furnace, at West Middlesex, Pa., have given a contract to Taylor Brothers, at Sharon, Pa., for the erection of a 1200-foot bin for the storing of ore, coke and limestone.

The Dunbar Furnace Company, Dunbar, Pa., have given their blast furnace employees a voluntary advance of about 5 per cent. in wages, taking effect March 1.

T. S. B. Wood and J. E. Wood of Sharon, Pa., are reported to have been in Cumberland, Md., last week looking over the plant of the Cumberland Rolling Mill, belonging to the Baltimore & Ohio Railroad Company, at Cumberland, Md., with a view of leasing it for operation.

Fannie Furnace, at West Middlesex, Pa., which has been idle for about three years, will go in operation in a short time.

The plant of the American Steel Casting Company, at Sharon, Pa., is to be enlarged by the addition of a steel building, 100 x 45 feet, and also two gas producers. The steel building will be erected by the Ritter-Conley Mfg. Company of Pittsburgh.

The Carnegie Steel Company, Limited, will erect a new office building at the Homestead Steel Works and also at the Edgar Thomson Steel Works.

The Brooke Iron Company, Birdsboro, Pa., have notified their puddlers that their wages will be advanced on April 1 to \$2.50 a ton, an increase of 10 per cent. over the present rate.

On account of the very large force of employees at the Homestead Steel Works, Homestead, Pa., it has been found necessary to have three pay days in the future. Day men will be paid on alternate Wednesdays, the clerical force on intervening Fridays and the tonnage men on alternate Saturdays. There are now employed at the Homestead Steel Works much the largest force in the history of the plant and the output is larger than ever before.

A very large force of laborers have been put to work making the excavations for the new plate mills of the Carnegie Steel Company, Limited, at Homestead, Pa. There is a considerable scarcity of laboring men in the Pittsburgh district and this firm have been considerably delayed on this account.

At the annual meeting of the stockholders of the Franklin Steel Casting Company, Franklin, Pa., the following officers were elected: Chas. W. Mackey, president; Chas. Miller, first vice-president; James W. Rowland, second vice-president; W. J. Bleakley, treasurer; Robert McCalmont, secretary, and W. B. Corinth, general manager. The business of this company is in a very prosperous condition, they having a large number of orders on hand, among which is one for rolls for shipment to Russia. A quarterly dividend of 1½ per cent. was declared.

The anthracite blast furnace, half a dozen farms and some tenant houses belonging to the Leesport Iron Company, at Leesport, Pa., have been sold at sheriff sale to James R. Weisner and J. S. Parvin for \$20,800. The furnace has been idle for a long time.

It is stated that last year the Bessemer department of the Duquesne Steel Works of the Carnegie Steel Company, at Duquesne, Pa., made 516,794 tons of steel from direct iron in two vessels of 9¼ tons capacity.

The Ohio Steel Company, Youngstown, Ohio, are now turning out from 1500 to 1800 tons of billets and sheet bars daily. These works are making some remarkable records for production, their output on certain days having gone above 2000 tons.

In January the blast furnace of the Ohio Iron & Steel Com-

pany, at Lowellville, Ohio, made 9111 tons of iron. The company are adding a new 500 horse-power boiler, which will considerably increase the output of this furnace.

The cast iron pipe plant of the old Londonderry Iron Company has been leased to the Montreal Pipe Foundry Company. They will be known as the Londonderry Pipe Company, and will supply the lower provinces with pipe, thus permitting the Montreal Pipe Foundry Company to extend their Western trade. F. J. Drummond of Montreal is president and C. A. Meissner of Londonderry, N. S., will be in charge of the manufacturing and the business at the Londonderry end.

On Monday, February 27, the plant of the Jefferson Iron Works, at Steubenville, Ohio, was sold at sheriff sale to D. J. Sinclair and others for \$127,700. It is stated that the works were bought in the interest of the La Belle Iron Works, Wheeling, W. Va., but this has not been confirmed. The plant embraces a blast furnace, at present operated under lease by the Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, a cut nail factory containing 128 machines and a skelp mill equipped to roll up to 15¼ inches in width. The plant has been idle for a long time, but it is to be overhauled and repaired and put in operation as soon as possible.

The Stirling Company of Chicago, through their Pittsburgh office, W. S. Elliott, general manager, have sold to the Alabama Steel & Wire Company, Ensley, Ala., 14 Stirling boilers, of 5500 horse-power.

We are advised that the statement that the Carnegie Steel Company, Limited, would erect a new splice bar mill at the Duquesne Steel Works is untrue. The present splice bar mill there is to be overhauled and enlarged and the capacity very much increased.

The Kelly & Jones Company of Pittsburgh, with works at Greensburg, Pa., and manufacturers of pipes and fittings for gas, steam and water, made this week a very large shipment of goods to Peru. This concern recently entered an order for 65,000 brass valves, the largest individual order of this kind ever placed in the United States.

### Machinery.

The Lloyd Booth Company, Youngstown, Ohio, are filling an order for two 250-ton metal mixers for the Ohio Steel Company of Youngstown, Ohio. They also have about finished a large hot bed table for the same company. It is built in sections, the total length being 150 feet and weighs 75 tons. They are also building an 18-inch continuous sheet mill with tables and other appliances for the Aetna-Standard Iron & Steel Company, at Martin's Ferry, Ohio. They recently furnished a 24-inch sheet mill with shears to the Pittsburgh Sheet Mfg. Company of Shousetown, Pa. This concern are also building considerable machinery for export. They have a very large amount of work on hand and are operating their large shops in Youngstown to full capacity, running night and day.

The bicycle factory and machine shop of Isadore Silverman & Bro., 109 West Fourteenth street, Chicago, was partly destroyed. Considerable material was on hand for the manufacture in addition to bicycles, the firm made light machinery and brass pattern work and did nickel plating. Many patterns were destroyed. Considerable material was on hand for the manufacture of bicycles, on which there was little salvage. The firm carried about \$65,000 insurance.

The Edward P. Allis Company of Milwaukee, through J. Wiedman Murray, manager of their Pittsburgh office, have just closed several large contracts with Laughlin & Co., Limited, owners of the Eliza Furnaces, at Pittsburgh, Pa. One of them is for four large cross compound condensing blowing engines of their "Steeple" type. Each engine has two 84-inch (effective) diameter by 60-inch stroke air cylinders, one 42-inch diameter high and one 80-inch diameter low pressure steam cylinder, each 60-inch stroke. The air cylinders are fitted with Reynolds' patent delivery and Kennedy's induction air valves. With this construction the clearance in the air cylinder is reduced to three-quarters of 1 per cent. of the piston displacement. The steam cylinders are fitted with Reynolds-Corliss steam gear. The main shaft is 24-inches diameter, on which is carried a 24-foot diameter fly wheel weighing 100,000 pounds. The shipping weight of these engines is 800,000 pounds each. This makes a total of six similar machines the Edward P. Allis Company have under construction with Laughlin & Co., Limited. They are also building seven more similar type of engines for other concerns in the Pittsburgh district, none of which are smaller, and several are 35 per cent. larger. Among these are two pairs for the Duquesne furnaces of the Carnegie Steel Company, Limited, each of which is 96-inches in diameter with 60-inch stroke; one 50-inch diameter high pressure and one 96-inch low pressure steam cylinder, each 60-inch stroke, and a smaller engine for Rosena Furnace of the American Steel & Wire Company, at New Castle, Pa. The Edward P. Allis Company have also contracted with Laughlin & Co., Limited, to furnish five 76-inch (effective) diameter air cylinders with heads and pistons complete, fitted with the Reynolds and the Kennedy air valves. These cylinders are to be placed on engines now in service at their Eliza furnaces.

Nordyke & Marmon Company of Indianapolis, Ind., a few days ago shipped a complete consignment of machinery for a flour mill outfit of 75 barrels capacity daily for Chill. Their



representative, E. A. McEwen, has just returned from Antwerp. He has been in Belgium and Germany for nine months erecting complete milling equipments for the production of distillers' products from American corn. In each of the installations quite a line of milling machinery arranged on the "degerminator system" of the above company has been included.

The Curtis & Co. Mfg. Company, St. Louis, Mo., report an increasing demand for air compressors, hoists and appliances. Their compressors have lately been added to the shop equipments of the Union Electric Company, Cleveland; Stow Mfg. Company, Binghamton, N. Y.; Davis Bros. Mfg. Company, Milwaukee, Wis.; D. M. Dillon Boiler Works, Fitchburg, Mass., and Missouri Car & Foundry Company, Madison, Ill.

The Magnetite Foundry Company, St. Louis, Mo., have contracted for a foundry 80 x 200 feet, to be built on modern lines. The building will be of brick, and the Pittsburgh Bridge Company have the contract for 80-foot span iron Fink trusses. Pneumatic hoists will be a feature of the shop equipment, and as the property is served by a railroad switch exceptional facilities are had for quick handling of material.

The Southwark Foundry & Machine Company of Philadelphia, through their Pittsburgh office, Henry R. Cornelius, manager, have sold to the Carnegie Steel Company, Limited, for their Edgar Thomas Furnaces, at Bessemer, Pa., five pairs of vertical steeple compound quarter-crank condensing blowing engines of the following dimensions: 44-inch high pressure steam cylinder, 78-inch low pressure steam cylinder, two 78-inch blowing tubs, all 60-inch stroke. These engines will be of massive build, with a heavy fly wheel between the high and low pressure engines. They will be condensed by one of the Weiss counter-current central condensing plants, also built by the Southwark Foundry & Machine Company.

The Grant Machine Tool Works, Cleveland, Ohio, U. S. A., have appointed Markt & Co., 193 and 194 West street, New York City, as their sole agents for Continental Europe, with offices and showrooms in Paris, Hamburg and St. Petersburg; and Chas. Churchill, Limited, whose main office is at 9-15 Leonard street, London, with branch offices and showrooms at Birmingham, Manchester and Glasgow, as their sole agents for the United Kingdom; the Marshall & Hushart Machinery Company, 62-64 South Canal street, Chicago, as their sole agents for Chicago and surrounding territory. They are building at present a line of modern machine tools, which embody many new time and labor saving features. Their line consists of milling machines, semi-radial drills, hand lathes, engine lathes, special cylinder ring lathes, improved countershafts, containing seven parts only, and some other specialties. Jno. J. Grant, formerly mechanical expert of the Cleveland Machine Screw Company, is mechanical engineer of this company.

The Westinghouse Machine Company of Pittsburgh, Pa., received during January the following orders for export: One 5 horse-power engine for the City of Mexico; two 15 horse-power engines for Stockholm, Sweden; one 35 horse-power engine for Iquique, Chili; one 35 horse-power engine with generator for Valparaiso, Chili; one 35 horse-power engine for Hamburg, Germany; three 160 horse-power engines with generators for Paris, France; two 160 horse-power and one 300 horse-power engines with generators, for England, and one 400 horse-power engine with generators for Havana, Cuba.

The Hall Steam Pump Company of Allegheny, Pa., have recently furnished to the United Salt Company, at Newburg, Ohio, a pump which operates on 85 pounds steam pressure, with compressed air to 500 pounds pressure. This concern have received an order for two cross compound condensers with 18-inch low pressure cylinders for the Johnstown works of the Federal Steel Company, at Johnstown, Pa.

The New Era Iron Works Company of Dayton, Ohio, report an unusual demand for the New Era gas and gasoline engines, especially in the large sizes. They build engines on order only, and have now in process of erection in their shops one 125 horse-power, one 80 horse-power, two 60 horse-power, two 50 horse-power, two 40 horse-power, besides a large number of smaller sizes. They build the largest single cylinder gas engine in the United States and are over 60 days behind their orders.

The Stanton Heater Company have been incorporated, at Bellaire, Ohio, with a capital stock of \$50,000. The company will manufacture a general line of heating and ventilating appliances. The incorporators are Howard Kirk, Henry Stanton, E. H. Rider, C. W. Dickens and W. C. Warnock.

The Pittsburgh Mining Machine Company of Pittsburgh, Pa., will make application on March 16 for a charter of incorporation. The incorporators are Samuel S. Brown, James M. McHugh, James A. Dewar, Austin H. Lucas and Augustus B. Burgwin. The concern propose to engage in the manufacture of electrical machinery for mining and other purposes.

Steel propeller blades are being made by the Penn Steel Casting & Machine Company, Chester, Pa., for the ocean steamers "St. Louis" and "St. Paul" of the International Navigation Company, each weighing 10,000 pounds. These blades bolted on the hub in their proper place would make a wheel 20 feet in diameter. The company also made solid cast steel rudders,

cast in one piece, weighing about 26,000 pounds, for the steamers "Waesland" and "Kensington," and have an order in hand for another solid rudder for the steamer "Southwark," and also two for the new steamships now being built on the Clyde for the same navigation company. The latter two rudders will weigh each 30,000 pounds. These manufacturers have, further, a very large amount of locomotive work on hand, as well as army and navy work, with a large amount of all kinds of other castings and additional orders constantly coming in, and report very favorable prospects for a prosperous year.

Norton Emery Wheel Company, Worcester, Mass., have recently made important additions to their large plant at Greendale, Worcester, consisting of a three-story and basement brick building to be used for office purposes, shipping rooms and stock rooms. The latter is one of the largest and most complete storerooms, admirably arranged on original lines, for the temporary storage of emery and corundum wheels and grinding machinery. On the opposite end the factory proper has been extended 50 feet, affording additional machine room. Norton Emery Wheel Company report a largely increased trade and the growth of their India oil stone business is highly satisfactory.

#### Hardware.

The Pope Tube Company, Hartford, Conn., are building a one-story addition to their factory. It is 20 x 40 feet, the sides being covered with corrugated iron and the roof with gravel. A frame shed, one-story high, 45 x 50 feet, will also be built.

Dille & McGuire Mfg. Company, Richmond, Ind., report a very satisfactory condition of business, orders taxing their capacity. The demand for their ball bearing lawn mower is especially gratifying.

Stewart Enamel Company, Bellaire, Ohio, advise us that the year closing January 31 was a very satisfactory one for them. The old Board of Directors has been re-elected and a cash dividend paid. Steps have been taken to increase the capital stock to \$100,000. In addition to the line of Stewart steel ware, the company are bringing out what they refer to as a superior line of steel agate ware. We are advised that the business of the company is such as to demand larger manufacturing facilities, which will be provided as rapidly as possible.

The new shovel plant of the New Castle Shovel Company, New Castle, Pa., is in course of erection, the foundations having just been completed.

#### Miscellaneous.

The Wilfred Eames Mfg. Company of Rochester, N. Y., have been incorporated, to manufacture grinders, with capital of \$10,000, by Wilfred Eames, Mardon Goodale and A. H. McCall.

The Toledo, Ohio, Steam & Air Motor Company, with capital of \$50,000, have been incorporated by C. E. Sutton, A. H. Smith, M. S. Franz, Eli A. Stark, B. F. Martien and J. F. Moore.

The Durable Wire Rope Company have been incorporated, at Trenton, N. J., with a capital of \$250,000. The company are empowered to manufacture and deal in wire rope or any kind of rope or cordage. The incorporators are George W. Mark, Daniel F. Platt and John C. Boyd of East Orange, N. J.

The How Bros. Company of Sauk Centre, Minn., have been incorporated for the purpose of manufacturing articles of tinware. The capital stock is placed at \$50,000.

Philo N. French of Pittsburgh has closed a contract to supply a quantity of sewer pipe for the City of Mexico. It is said the contract aggregates about \$600,000. Delivery of the pipe extends over two years. The pipe will be manufactured at the plant of the San Antonio Sewer Pipe & Mfg. Company, San Antonio, Mexico.

Steel & Iron Metal Coating Company, manufacturers of Wilder's patent metal coating, West Chicago, Ill., held a stockholders' meeting on January 28, and the following directors were re-elected for the ensuing year: R. A. Vogt, C. A. Franzen, Chas. Wilder, W. J. Wilder, Thomas Walkup and W. H. Kirchhoff. After the stockholders' meeting the directors elected the following officers for the ensuing year: W. J. Wilder, president; Thomas Walkup, secretary, and W. H. Kirchhoff, treasurer. The stockholders also voted to increase the capital stock of the company from \$30,000 to \$50,000. The company report business very good with them. They have received quite a number of large orders since January 1. They have also received a large number of foreign inquiries on account of advertisements in *The Iron Age* and *The Metal Worker*.

The Ludlow-Saylor Wire Company, St. Louis, advise us of a rapidly increasing demand for elevator cabs and inclosures, grilles, screen cloth, &c. In their bank and office railing department they are working an increased force, and have their order book well filled. As an evidence of the extent of territory covered by this company, we might state they are in receipt of a large order for bank railing for the Russo-Chinese Bank, Vailvostock, East Siberia.

On March 1 application will be made for a charter of incorporation for Duquesne Coal & Coke Company of Pittsburgh, which concern propose to engage in the mining, digging and selling of coal and the manufacture of coke and its by-products. The incorporators are W. Y. Humphreys, Herman Griffin, A. M. Byers, Jr., M. A. Preston and Wm. Harris.



## The Iron and Metal Trades.

The Iron and Steel markets are booming, and seem now entirely out of the control of the sellers. Prices have been jumping dollars per ton and the excitement is spreading. As for the first half of the current year, it has ceased to be a question of price, and has become a matter of ability to deliver at all.

It is not so long since that the majority in the trade pooch-pooched the prediction that there would be a scarcity of Pig Iron. The fact is admitted now, and the only question is when relief may be expected. That may be brought about either by the blowing in of additional furnaces or by the checking of the export shipments or by the falling off in the home demand. For the first half of the current year not a single one of these factors, nor all combined, will make any impression. Will it come early or late in the second half? We believe that in this respect the hopes of many will be doomed to disappointment. It is true that a number of large new or remodeled plants in the Central West are to fall into line after the first of July, and that furnaces now idle are expected to start in soon. It is true that a number of small Eastern stacks are trying to get ready, and the same is true in Virginia and the South.

But with many enterprises it is not a matter of putting plant into shape, but of getting Raw Materials. In the Central West, in the East and in Virginia the Ore problem is the troublesome one, although relief may come to some through imported Ores. In the South it is a matter largely of fuel.

The export business, of course, will be checked. The tonnage of all kinds foots up to about 800,000 to 900,000 tons. For the first six months and for a part of the second half much has been contracted for. In some cases even now it has been possible to delay deliveries and thus get room to take on domestic work. In some lines, like in Southern Pig Iron, the contracts provide that the metal must go abroad, and switching may not be possible. Under the circumstances it does not look as though much relief can be expected before October.

As an offset it must be considered that in many lines the consumers have been bare of stocks for years without feeling any inconvenience. They are having rather novel experiences now and are endeavoring to guard against them by accumulating some reserve. In the aggregate this means a big tonnage.

The shortage of material has been emphasized during the week by some happenings. A leading Wire interest has purchased and is about to close for several blocks of Billets, aggregating about 50,000 tons, for Eastern delivery. Two Eastern Steel works have purchased a stock of about 50,000 tons of Bessemer Pig in the yards of a plant which is now limiting its operations to special quality. What the second half will bring in Bessemer Pig in the Central West will develop in a few days. For earlier shipment the furnaces have sold as high as \$12.50 and are now out of the market.

There have been heavy sales of Mill Iron East and West. The scarcity and high price of Billets, which have jumped to \$22, Pittsburgh, are starting every puddling mill still in good condition, and the demand for Mill Iron has, therefore, been very heavy.

In Foundry Iron there have been large purchases in the East, while in the Chicago district a large car company have taken 4000 tons of Northern Iron and a like quantity of Southern Pig for the second half.

Advances have taken place along the whole line of Finished Iron and Steel. Structural Material is up \$2 per ton and Bars are \$2 higher. Plates, Sheets and Skelp are very difficult to buy, at a sharp advance. Merchant Pipe makers have issued new uniform discounts. Cut Nails are higher and interest centers on the proposal to gather the Eastern works into a consolidation.

A sharp advance has taken place in Wire products, and in Tin Plate a further upward move is imminent.

## A Comparison of Prices

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

	Feb. 1, 1899.	Feb. 22, 1899.	Feb. 1, 1899.	Feb. 2, 1898.
<b>PIG IRON:</b>				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$13.50	\$12.25	\$11.75	\$10.70
Foundry Pig, No. 2, Southern, Cincinnati.....	12.50		10.75	9.00
Foundry Pig, No. 2, Local, Chicago.....	13.00	12.50	11.50	10.75
Bessemer Pig, Pittsburgh.....	13.50	12.50	11.00	10.30
Gray Forge, Pittsburgh.....	12.50	11.50	10.00	8.90
Lake Superior Charcoal, Chicago.....	14.00	13.00	12.00	11.25
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh.....	22.00	19.50	17.25	15.25
Steel Billets, Philadelphia.....	24.00	22.00	19.25	17.30
Steel Billets, Chicago.....	23.00	21.00	18.50	17.10
Wire Rods, Pittsburgh.....			26.00	22.50
Steel Rails, Heavy, Eastern Mill.....	23.00	22.00	19.00	18.00
Spikes, Tidewater.....	1.55	1.50	1.50	1.50
Splice Bars, Tidewater.....	1.20	1.15	1.15	1.15
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago.....	9.00	8.00	8.00	8.50
O. Steel Rails, Philadelphia.....	12.75	12.00	11.50	10.50
O. Iron Rails, Chicago.....	14.50	14.00	13.75	12.00
O. Iron Rails, Philadelphia.....	15.00	13.75	13.50	12.50
O. Car Wheels, Chicago.....	14.50	13.00	13.00	11.50
O. Car Wheels, Philadelphia.....	13.50	12.50	10.75	10.50
Heavy Steel Scrap, Chicago.....	8.00	8.00	8.00	7.50
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia.....	1.25	1.20	1.20	1.07½
Common Iron Bars, Youngstown.....	1.15	1.10	1.05	0.95
Steel Bars, Tidewater.....	1.35	1.20	1.17½	1.10
Steel Bars, Pittsburgh.....	1.25	1.20	1.05	0.95
Tank Plates, Tidewater.....	1.70	1.65	1.45	1.10
Tank Plates, Pittsburgh.....	1.60	1.50	1.40	0.97½
Beams, Tidewater.....	1.55	1.45	1.40	1.30
Beams, Pittsburgh.....	1.40	1.30	1.30	1.15
Angles, Tidewater.....	1.40	1.35	1.30	1.15
Angles, Pittsburgh.....	1.30	1.20	1.20	1.00
Skelp, Grooved Iron, Pittsburgh.....	1.40	1.35	1.20	1.05
Skelp, Sheared Iron, Pittsburgh.....	1.50	1.45	1.35	1.10
Sheets, No. 27, Chicago.....	2.30	2.25	2.10	2.05
Sheets, No. 27, Pittsburgh.....	2.10	2.05	1.95	1.90
Barb Wire, f.o.b. Pittsburgh.....	2.35	2.10	1.95	1.80
Wire Nails, f.o.b. Pittsburgh.....	1.85	1.60	1.50	1.50
Cut Nails, Mill.....	1.40	1.35	1.30	1.10
<b>METALS:</b>				
Copper, New York.....	17.75	17.90	17.00	11 87½
Spelter, St. Louis.....	6.00		5.40	3.95
Lead, New York.....	4.30	4.40	4.65	3.70
Lead, St. Louis.....	4.30		4.30	3.60
Tin, New York.....	24.00	24.25	25.00	14.20
Antimony, Hallett, New York.....	10.00	10.00	9.00	7.50
Nickel, New York.....	38.00	38.00	38.00	33.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York.....	3.69	3.69	3.44	2.90

## Chicago. (By Telegraph.)

Office of The Iron Age, 805 Fisher Building, {  
CHICAGO, March 1, 1899. }

Scarcity is reported in all classes of material and prices have advanced considerably. It is difficult to secure anything in the Steel line for earlier delivery than four to six months. The largest manufacturers appear to be the most completely sold up. All Galvanized products are advancing sharply on account of the high cost of Spelter. The new consolidations are being formed in Bars and Sheets. The Bar manufacturers are meeting in New York this week and the Sheet manufacturers will meet in this city Wednesday, March 1. The representatives of the mills forming the National Steel Company are in this city at present for the purpose of transferring their properties to that company. Manufacturers' agents in many lines are spending much of their time now in trying to make their old customers feel that they are not being treated badly when their orders are refused by the mills. Buyers are greatly exercised over the continued advance in prices and are apprehensive that still higher values may be reached. Many are preaching conservatism, but it is realized that under existing conditions the conservative man may be a heavy loser if he permits his inclination to influence his judgment.

**Pig Iron.** — Sales of the past week have been confined to rather small quantities, but prices have shown such a tendency to advance that large inquiries are now coming out and consumers are getting quite anxious to buy for delivery during the latter half of the year. Our quotations show advances on local and Southern Coke and Charcoal Iron, but they do not show the highest prices which have been reached. No. 1 Soft Southern has been sold up to \$14.50 for 200 tons delivered prior to July. We quote for cash as follows:

Lake Superior Charcoal.....	\$14.00 to \$15.00
Local Coke Foundry, No. 1.....	13.50 to 14.00
Local Coke Foundry, No. 2.....	13.00 to 13.50
Local Coke Foundry, No. 3.....	12.75 to 13.00
Local Scotch, No. 1.....	13.50 to 14.00
Ohio Strong Softeners, No. 1.....	14.00 to 14.50
Southern Silvery.....	to .....
Southern Coke, No. 1.....	14.00 to 14.25
Southern Coke, No. 2.....	13.50 to 13.75
Southern Coke, No. 3.....	13.00 to 13.25
Southern Coke, No. 1 Soft.....	14.00 to 14.25
Southern Coke, No. 2 Soft.....	13.50 to 13.75

Foundry Forge.....	to .....
Gray Forge and Mottled.....	to .....
Southern Charcoal Softeners.....	to .....
Alabama and Georgia Car Wheel.....	16.50 to 17.50
Malleable Bessemer.....	13.50 to 14.00
Standard Bessemer.....	13.50 to 14.00
Spiegel, 20 per cent.....	to 30.00
Jackson County Silvery, according to Sil-	
con.....	13.50 to 15.50

**Bars.**—A heavy demand is reported, especially for Soft Steel Bars, of which sales have been made in lots up to 5000 tons. Several sales of Bar Iron in lots of 1000 to 2000 tons have been made. Buying is of a general character, coming from wagon makers and agricultural interests as well as from car builders. Sales of mill shipments of Common Iron were made during the week as low as 1.17c., but 1.30c., Chicago, now seems to be the bottom price, some mills asking 1.35c. Mill shipments of Soft Steel Bars are quoted all the way from 1.30c. to 1.40c., Chicago. Hoops have stiffened considerably, mill shipments now being held at 1.45c., base, Chicago, for Bands, while no concessions are made on extras, but the full list is charged. Jobbers are having a heavy demand from store and quote small lots at 1.45c., full Iron extras, for both Iron and Soft Steel Bars. Norway and Swedish Iron is held at 3.20c.

**Car Material.**—Car building interests continue to be important factors in the market, good orders being placed on this account.

**Structural Material.**—The most important contract of the week was the Marshall Field Building, which will take 3000 tons. Quite a number of small jobs have also been put under contract aggregating quite a considerable tonnage. Several buildings are coming up which had not previously been mentioned. The outlook continues very favorable for building interests. The demand for bridge material is good. An advance was made on the 23d ult. of \$2 per ton on all Shapes. Mill shipments are quoted as follows, Chicago delivery: Beams and Channels, up to 15 inches, 1.55c. to 1.60c.; 18 to 24 inches, 1.65c. to 1.70c.; Angles, 1.45c. to 1.50c.; Universal Plates, 1.80c.; Tees, 1.60c. to 1.70c. Small lots from store are selling at 2c. upward for Beams and Channels, 15-inch and less; 1.55c. to 1.60c. for Angles, and 1.70c. to 1.75c. for Tees.

**Plates.**—The local manufacturers have made sales of several thousand tons for delivery in the last half of the year. Among these sales was a considerable quantity to go to Pittsburgh, on which 1.50c. to 1.55c., Chicago, was obtained, and even at this price the buyers desired to place a much larger order, which was refused. Jobbers are having an extremely good business from store and talk of raising Tank to 2c. Mill shipments for such deliveries as can be made are quoted as follows, Chicago delivery: Tank Steel, 1.55c.; Flange, 1.65c.; Marine, 1.90c.; Common Fire Box, 2.10c.; Best Fire Box, 3c. to 4c.

**Merchant Pipe.**—The mills are as far behind as ever in deliveries on orders, and it looks as if consumers will suffer this summer for want of Pipe. A new list went into effect on February 22. The manufacturers have changed the list so that one discount now applies to everything, whether Black or Galvanized, and whether Butt or Lap Welded. The discount fixed on mill shipments is 60 and six 10's. Merchant Boiler Tubes are quoted at 65 and 5 per cent. off on 2 and 2½ inch, and 70 and 5 per cent. off on 2¾-inch and larger.

**Sheets.**—Owing to difficulty in getting Sheet Bars the manufacturers of Sheets are extremely careful in quoting. The market is active, being only limited by the disposition of mills to sell. Mill shipments are quoted at 2.30c. to 2.45c., Chicago, on No. 27 Black, and 75 to 75 and 10 per cent. off with 15c. freight allowance on Galvanized. Small lots of No. 27 Black are quoted by jobbers at 2.50c. to 2.60c., and Galvanized at 75 and 5 per cent. off.

**Merchant Steel.**—Manufacturers' agents report an active demand with advancing prices. A meeting of the Cold Rolled Steel manufacturers was held here last week at which an advance was agreed upon. Good contracts are being placed at the advance. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.75c.; Smooth Finished Tire, 1.55c.; Open Hearth Spring Steel, 1.90c. base; Sleigh Shoe, 1.55c. to 1.60c.; Toe Calk, 1.80c., base; Ordinary Tool Steel, 5.50c. to 7c.; Specials, 10c. upward. Jobbers are quoting small lots from stock at 2.10c. for Tire, 2.30c. for Machinery, 2.40c. for Spring, and 2.30c. for Toe Calk, full extras.

**Billets and Rods.**—No sales are reported because the local mills are unable to furnish anything desired in this line. Nominal quotations are \$23 for ordinary Bessemer Billets, \$25 for Open Hearth Billets, and \$30 for Wire Rods.

**Rails and Track Supplies.**—A great deal of tonnage is offered, but the mills are unable to make delivery on a considerable part of the business thus coming up and have to pass it. They continue to quote \$23 on Standard Sections in large lots, but ask \$1 and \$2 advance on small lots. Some sales have been made up to \$24.75. Light Rails are held at \$21 to \$24. Track Supplies are quoted as follows: Splice Bars, 1.25c. to 1.35c.; Spikes, 1.65c.; Track Bolts, with Hexagon Nuts, 2.30c. to 2.35c.; Square Nuts, 2.10c. to 2.15c.; Steel Links and Pins, 1.65c. to 1.75c.; Iron Links and Pins, 1.65c. to 1.75c.

**Old Material.**—Dealers report a good demand for everything in this line. Old Iron Rails have been in particularly sharp request and prices have advanced with every transaction. Sales are reported at \$14.50 to \$16, Chicago. Old Steel Rails have shown increased strength, while Old Car Wheels have made a considerable move upward under increasing inquiry. Cast Scrap is steadily advancing owing to the short supply and the good demand. Dealers' selling quotations are nominally as follows, per gross ton: Old Iron Rails, \$15.50 to \$16; Old Steel Rails, mixed lengths, \$9 to \$9.25; selected long lengths, \$10 to \$11; Relaying Rails, \$14 to \$15; Old Car Wheels, \$14.50 to \$15; Heavy Melting Steel Scrap, \$8 to \$8.75; Mixed Steel, \$7 to \$7.25. The following selling prices are per net ton: No. 1 Railroad Wrought, \$13 to \$13.50; Dealers' Forge, \$11.25; Fish Plates, \$13.75 to \$14; No. 1 Mill, \$7.75 to \$8; Heavy Cast, \$9.50 to \$10; Stove Plates, \$7.50 to \$8; Iron Car Axles, \$16.50; Horseshoes, \$10.50 to \$10.75; Cast Borings, \$4.75; Steel Axle Turnings, \$7.50; Iron Axle Turnings, \$8; Machine Shop Turnings, \$6.50 to \$6.75.

**Metals.**—Copper has slightly receded and carload lots of Lake are now quoted at 18¾c., with Western 17¾c. Spelter is strongly held at 6c. to 6¼c. Pig Lead is a little lower owing to offerings from second hands and has been sold down to 4¼c.

**Tin Plate.**—The demand for Tin Plate is very heavy, but the manufacturers are meeting with difficulty in securing a sufficient supply of Bars to keep their mills running to full capacity. The advance in Steel is making another advance imminent in Tin Plate, which may be expected any day. Jobbers are having a good trade with such large quantities called for that they are obliged to cut them down.

Rogers, Brown & Co., Monadnock Building, Chicago, have taken possession of the Iroquois Furnace, and from this time will manage it and sell its product. They propose to proceed immediately to build one of the largest and most modern furnaces in the United States adjoining the furnace now on the property.

## Philadelphia.

Office of The Iron Age, Forrest Building, 1  
PHILADELPHIA, PA., February 28, 1899.

The market during the past week has been of a wilder character than anything we have had for many years. It has been impossible to keep close track of quotations, because of the variety of ideas among sellers. One would take a notion to make a sharp advance in prices, while others would go along at the figures quoted a few days before, and in this way a variety of prices were all under way at the same time. At this writing, however, there seems to be a more settled feeling, and a general recognition of a full dollar advance during the week on Pig Iron, and an average advance of about \$2 on Finished Material. To venture an opinion on the market at this juncture is more of a risk than it has been for months past. The present condition of affairs was pretty clearly foreseen some time ago, but from now on it requires a good deal of nerve to commit one's self to anything. It does seem, however, as though prices would go higher, possibly a dollar per ton on Pig Iron before April 1, and possibly further advances may be made later on, but ordinarily it would be regarded as good policy to be content with what has already been realized. It must be remembered, however, that it is not a sellers' boom at all; on the contrary, buyers have taken the market into their own hands, and are running things pretty much to suit themselves, and if they put prices several dollars per ton higher, it will in some degree be their own fault. If mills and furnaces are over-sold as understood, users of Iron and Steel are the people to whom the deliveries must be made, so that they ought to be satisfied for the present. The great pressure now, however, is to buy for the last half of the year, although there is some pressure for certain grades of Iron for March and April shipments. Taking everything into consideration, it looks as though the scarcity might continue pretty well through the spring months, but if prices are pushed much higher, it may be that midsummer will find the supply of Iron greater than is required, and when that point is reached the market soon feels it,



and, as a rule, it is a long time before it can be made to feel anything else. There is no doubt that conditions are entirely different from anything we have had in the past, and, as we said before, it requires a good deal of nerve to undertake to say what position the market may be in a month or two from now, but those who have large interests at stake begin to think that the pace is getting to be too rapid, and that it would probably be a good thing to let things settle about where they are.

**Pig Iron.**—It is many years since there has been as much excitement in the Pig Iron market as during the past week. Buyers and sellers alike have been completely mystified, and are in not much better shape to-day. The only perfectly clear thing has been that buyers wanted Iron in large quantities and when offers were made they were almost invariably accepted without much regard to price. Sellers have become so much used to 10c. and 15c. advances that 25c. to 50c. movements almost paralyzed them, and some are still trying to find out "where they are at." There can be no doubt, however, that movements in Pig Iron have been wilder than they have been for years, and it is not surprising that the trade are very much at sea. Nevertheless, the one great fact that confronts them is an unprecedented scarcity of Iron, and until that is measurably relieved it will be useless to expect a settled market. Ultimately and possibly inside of 30 or 60 days the supply, or the prospects of increased supply, may relieve the tension somewhat, but for the immediate future it is believed that there will be a good deal of scrambling for prompt shipments. Under these conditions it is difficult to give exact quotations, but to-day's prices are fairly covered by the following, which are for seaboard deliveries, or the equivalent at nearby points: No. 1 X Foundry, \$14.50 to \$15; No. 2 X Foundry, \$13.50 to \$14; Plain, \$12.75 to \$13.25; Standard Mill Iron, \$13 to \$13.25.

**Billets.**—There is nothing doing in this vicinity, prices being considered too high, and as buyers are fairly well supplied, they are inclined to wait developments. Quotations are nominally about \$24 at seaboard, but they attract no attention at present.

**Plates.**—The demand for Plates continues without abatement, and prices are again higher. Mills cannot begin to take care of all the business offered to them, and it is a serious problem to know how they are going to make deliveries on what they have sold, unless more time is allowed. Buyers not only want prompt deliveries, but they want every ton they can get, so that new business is different to squeeze in just now. Prices for carload lots and upward are quoted as follows for seaboard deliveries:  $\frac{1}{4}$ -inch and thicker, 1.75c. to 1.80c.; Shell, 1.85c.; Flange, 1.95c. to 2c.; Fire Box, 2.10c. to 2.25c.

**Structural Material.**—The demand is very heavy, and mills in this line are greatly crowded with business. Prices have been advanced, but little heed is given to official quotations, as every mill that can make deliveries to suit buyers' requirements seems to be in a position to make its own prices. The official rates at seaboard are as follows, but a great deal of business for prompt delivery is done at from a tenth to two-tenths higher: Angles, 1.43c.; Beams, 15-inch, 1.53c.; Tees, 1.58c.; Zee Bars, 1.57c.; Bulb and Deck Beams, 1.73c.

**Bars.**—There is an extraordinary demand, and prompt shipments are as hard to get as is the case with other specialties. Prices are higher, and are now quoted as follows for seaboard or equivalent deliveries in carload lots and upward: Ordinary Bars, 1.15c. to 1.20c.; Refined Bars, 1.25c. to 1.30c.; Test Bars, 1.30c.; Steel Bars, 1.30c. to 1.35c.

**Sheets.**—The demand shows no abatement, and is sufficient to keep all the mills running full time and to full capacity. Prices are strong and quoted as follows for best makes (Common Sheets about two-tenths less): No. 10, 1.90c. to 2c.; No. 14, 2.10c. to 2.20c.; No. 16, 2.30c. to 2.40c.; Nos. 18-20, 2.50c. to 2.60c.; Nos. 21-24, 2.40c.; Nos. 26, 27, 2.50c.; No. 28, 2.60c. to 2.70c.

**Old Material.**—It is very difficult to keep in close touch with quotations, as they are liable to vary in almost every transaction. The most notable sale was one of 4000 tons of foreign Iron Rails, subject to drawback of duty, at \$17, delivered to a nearby mill, but in other cases some surprising figures have been realized. A fair average of to-day's prices for deliveries in buyers' yards would be as follows: Cast Borings, \$9 to \$9.25; Wrought Turnings, \$10 to \$10.25; Machinery Cast, \$10.25 to \$11; Old Car Wheels, \$13.50 to \$14; Heavy Steel Scrap, \$12.75 to \$13.25; Steel Rails, \$12.75 to \$13; Iron Rails, \$15 to \$16; Choice Railway Scrap, \$14.75 to \$15; Iron Axles, \$16.50 to \$17; Steel Axles, \$14 to \$15.

## St. Louis. (By Telegraph.)

Office of The Iron Age, 512 Commercial Building, {  
ST. LOUIS, March 1, 1899.

**Pig Iron.**—As far as the consumer is concerned, the Pig Iron situation shows no change for the better. Prices are revised almost daily and advances of 25c. per ton are being made to a degree that is causing belated foundrymen to think seriously of the prevailing conditions. Sales were made at Southern furnaces Monday of No. 2 Foundry representing \$13.50, St. Louis, No. 3 Foundry on basis of \$13, St. Louis, and Gray Forge at \$12.50, St. Louis. Domestic wants are daily increasing, and, to the wonder of close observers, the foreign demand is even more active than in the past. One of our large Southern interests has booked about one-fourth of their product to export orders, and it must not be forgotten that inquiry from foreign sources does not diminish, as much of this business is for the third quarter of the year. It is safe to say that the scarcity of Iron is not confined to America, nor are the better trade conditions peculiar to us. Our foreign relations are shrewd buyers, particularly as they pay cash against documents, and they are not inclined to lay out funds unless an opening exists for the finished product. The outlook is for higher prices and it will be wise for buyers to realize this. Prices are named for immediate acceptance only and approval of orders must generally be expected from holders of Iron. Figures named below are nominal, only f.o.b. cars St. Louis, and cannot be considered as fixed:

Southern, No. 1 Foundry.....	to \$14.00
Southern, No. 2 Foundry.....	to 13.50
Southern, No. 3 Foundry.....	to 13.00
No. 1 Soft.....	to 14.00
No. 2 Soft.....	to 13.50
Gray Forge.....	to 12.50
Mottled.....	to 12.00

**Bar Iron.**—Sales keep up finely, and the car works of St. Louis are running unusually well on orders. The mills continue their independent attitude, but may be said to help along their old customers. The rumored organization of Bar Mills may take shape, and if so it is quite likely that to-day's price of 1.25c. in carloads at mills will not long remain.

**Rails and Track Supplies.**—The demand for new rails daily increases and at stiff prices. Old Iron Rails are now quotable at \$14 and Old Steel Rails at \$10.50. Supplies show higher prices, and we quote Splice Bars, 1.35c. to 1.40c.; Track Bolts, with Square Nuts, 2c.; with Hexagon Nuts, 2.10c.; Iron or Steel Links and Pins, 1.50c.; Spikes, 1.70c.

**Sheets.**—Orders for Steel Sheets are still going begging and probably due to the proposed combine of the mills, which seems near at hand. The price on No. 27 Black is 2.30c., f.o.b. East St. Louis, and the discount on Galvanized has shortened to 75 and 5 per cent. off, with small freight allowance.

**Pig Lead.**—It is rather difficult to quote prices on Pig Lead, but nominally it may be placed at 4.20c. to 4.22 $\frac{1}{2}$ c. The market is in that peculiar condition where a seller must make concessions. The prospective purchaser is placed in the same position and the result is gratifying. The price of Lead Ore was \$26 per ton in the Joplin, and showed no change from the previous week's quotations.

**Spelter.**—Zinc Ore dropped \$6 per ton and the ruling top price obtained in the Joplin district was consequently \$42 per ton. There is little Spelter offered, and the price may only arbitrarily be placed at 6c.

## Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, {  
CINCINNATI, March 1, 1899.

The past week has been one of the most active in Pig Iron circles for some time. Quite a number of orders, some of them for round lots, have been closed with both Southern and Northern furnaces for delivery during the last half of the present year. The demand for immediate delivery and also for April and May is as strong as it has been and the same trouble is complained of which has existed for weeks past, that it is very hard for agents to find Iron with which to fill orders which are offered to them. The fact that Bessemer Iron is selling on such a profitable basis is tending to make the Ohio furnaces work in that direction to the exclusion of Foundry brands. The demand from general foundries is even stronger than it has been, and the understanding is that they are getting quite an advance on all casting now being contracted for. The situation is as strong as it has ever been known to be, and Iron keeps continually advancing. The question continues to be, not what prices are asked for furnace product, but rather, what furnace has Iron to sell on satisfactory deliveries at any



price. A good many of the furnaces are practically out of the market and quite a number of them are refusing to do business on the basis of delivery the last half of the year. While the quotations furnished herewith are understood to represent the market, yet there are stories of sales made at a still higher figure when the delivery was made satisfactory. \$9.50 for No. 2 Foundry, Birmingham basis, has been bid for warrants and the holders declined to sell. Revised quotations, f.o.b. Cincinnati, are as follows:

Southern Coke, No. 1.....	\$13.00 to \$13.25
Southern Coke, No. 2.....	12.50 to 12.75
Southern Coke, No. 3.....	12.00 to 12.25
Southern Coke, No. 1 Soft.....	13.00 to 13.25
Southern Coke, No. 2 Soft.....	12.50 to 12.75
Southern Coke, Gray Forge.....	11.75 to 12.00
Southern Coke, Mottled.....	11.75 to 12.00
Ohio Silvery, No. 1.....	12.75 to 13.25
Ohio Silvery, No. 2.....	12.25 to 12.75
Lake Superior Coke, No. 1.....	12.75 to 13.00
Lake Superior Coke, No. 2.....	12.50 to 12.75

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$15.00 to \$15.75
Lake Superior Car Wheel and Malleable..	15.00 to 15.25

**Plates and Bars.**—The demand for mill product has been especially active, and Sheets and Plates are bringing just about what sellers care to ask for them. Mills in this vicinity which have open order books and can make satisfactory deliveries are getting prices much ahead of quotations elsewhere. We quote, f.o.b. Cincinnati: Bars, wholesale, 1.35c. to 1.45c., with half extras; Bars, retail, 1.50c. to 1.60c., with full extras; Plates, 2c.; Bar Angles, 1.35c. to 1.55c.; Sheets, No. 27, 2.35c. to 2.40c.; No. 10, 2.10c.; No. 16, 2.25c.

**Old Material.**—The market has been quite active and a large amount of material has been changing hands. Indications for an active season are good. We quote, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, \$12 to \$12.25 net; Cast Scrap, \$9 to \$9.50, gross; Car Wheels, \$11.50 to \$12, gross; Iron Axles, \$15.50 to \$16, net; Iron Rails, \$14 to \$14.50; Steel Rails, \$9.50.

### Pittsburgh.

Office of The Iron Age, Hamilton Building,  
PITTSBURGH, March 1, 1899.

(By Telegraph.)

**Pig Iron.**—Last Saturday there were 12,000 tons of Bessemer Pig Iron sold by the Pig Iron Association at \$12.50, Valley furnace, for delivery this side of July. No Iron has been sold for delivery beyond July, but this will likely be taken up in a few days and the price fixed for delivery in second half of the year. Since the above sale was made the market has again advanced and it is doubtful if any Bessemer Pig could be bought to-day at less than \$13, Valley furnace, and it is reported that offers for Iron have been made at that price. The furnaces are practically sold up to July and no large amounts of Iron are to be had. There is not much demand for Bessemer Pig and what is selling is in small lots of 250 to 1000 tons. Forge Iron is the most active on the list, and in the past week there have been sales of fully 20,000 tons at prices ranging from \$11.75 up to \$12, Valley furnace. The market to-day is all of \$12, Valley, and \$12.50 to \$12.65, Pittsburgh. A good deal of Valley Forge Iron is being shipped into Pittsburgh, the freight being 65c. Inquiries are in the market for a good deal more and higher prices in the next few days are certain. Foundry Irons are active, and some of the large consumers have been caught short and have come into the market in the last few days and bought at the high prices now ruling. The whole Pig Iron market is excited and all sorts of predictions are being made as to how high prices will go. It is generally conceded that Bessemer will go to \$15 and Forge to \$13 or \$14, Valley. There is a scarcity of Iron and already there is talk of Southern Forge coming into Pittsburgh if the price should go a little higher. It should be noted that the prices we quote are for to-day and by Thursday or Saturday the market may be considerably higher. We quote Bessemer Pig at \$13, Valley; Gray Forge, \$12, Valley; No. 2 Foundry, \$13 to \$13.15; Gray Forge, \$12.50 to \$12.65; Bessemer, \$13.50 to \$13.65, all f.o.b. Pittsburgh. We note sales of 16,000 to 18,000 tons of Bessemer Pig at \$12.50, Valley; also sales aggregating 15,000 tons of Gray Forge at \$12.50, Pittsburgh, and one sale of 2000 tons of Gray Forge at \$12, Valley.

**Steel.**—There are a good many inquiries for Billets and the market is considerably excited. Prompt Steel has sold at \$21.50, Pittsburgh, but the market to-day is probably all of \$22, maker's mill. Sales of Steel are reported on the basis of \$23, delivered Cleveland. The three local Steel mills outside the National Steel Company are oversold and have no Steel to spare. Mills are not making deliveries on contracts and the scarcity of Billets is growing worse every day. We quote Steel to-day at \$22, Pittsburgh, with the tendency of prices decidedly upward.

**Muck Bars.**—Prices are away up and we quote Standard Grade Muck Bars at \$22, Pittsburgh.

**Spelter.**—The market is off a little and prime grades of Western Spelter are offered at 6.25c., Pittsburgh.

**Sheet Bars.**—The National Steel Company are not offering Sheet Bars and there are none to be had, and all sorts of fancy prices are being offered for Bars, but without getting them.

(By Mail.)

The leading feature in the Iron and Steel markets since our last report has been further advances in all kinds of material, from Pig Iron to Finished product. While Bessemer Pig is practically no higher than last week, Gray Forge and Foundry have advanced still further. Ferromanganese has gone up \$5 a ton in large lots and \$7.50 in small lots. Beginning with Finished Material we note that Beams and Channels and all kinds of Structural Shapes are up \$2 a ton; Plates about \$2 a ton; Merchant Steel from \$1 to \$2; Merchant Pipe about 11 per cent.; Casing 10 per cent.; Skelp from \$1 to \$2 a ton; Sheets about \$2 and Iron and Steel Bars about \$2 a ton. Spelter is stationary, but with another buying movement by consumers will probably go still higher. Demand keeps up, and as one leading house put it this morning, "It is not a question of getting business, but where to find a mill that has anything to sell." In Billets large consumers are out of the market, but small lots of prompt Steel have sold at \$21 to \$21.50, maker's mill, Pittsburgh. The situation is fully as strong as at any time since prices commenced to go up, and still higher figures are almost certain. The National Steel Company are taking over the Billet and Bar mills to-day, and this concern are regarded here as one of the strongest of the large corporations recently formed. The officers who have their affairs in charge are regarded as experts in the manufacture of Steel, and a very successful future is predicted for the new company.

**Ferromanganese.**—With the blast furnaces and Steel works being operated to their utmost capacity a change in the situation in Ferro has come and a shortage in supply is likely. With this in view, the producers of Ferro, between whom an agreement exists, have advanced prices \$5 a ton in large lots and \$7.50 in small lots. We quote domestic Ferro at \$55 in 100-ton lots and over, and \$60 in carload lots, f.o.b. cars maker's works. It will be noted that prices are now f.o.b. maker's mill, in place of delivered, as heretofore.

**Structural Material.**—In less than 24 hours' notice last week, the makers of Structural Shapes made an advance of \$2 a ton, taking effect at once. This advance, it is stated, is justified by the advance in Raw Material and the prices for all other kinds of Finished products. The outlook for tonnage this year in Structural Material could hardly be better. A great deal of work is under way and orders at the present time are very heavy. Shipments in January by Structural mills were much larger than usual, and sales were three times as large as in January last year. A great deal of work is coming up, including buildings in Cleveland and a court house in West Virginia, and a great deal of Eastern work. We have advanced prices \$2 a ton, and now quote as follows: Beams and Channels, 15-inch and under, 1.40c.; 18, 20 and 24 inch, 1.50c.; Angles, 1.30c.; Zees, 1.40c.; Tees, 1.45c., all f.o.b. cars Pittsburgh.

**Rails.**—The large contracts for Rails were all placed some time since, and tonnage at the present time is made up of small lots. The Rail mills are all sold up for months ahead. We quote Steel Rails, Standard Sections, at \$22, Pittsburgh; Light Sections, 25 to 40 pounds, \$22 to \$24, depending on the order and deliveries required; 16 to 20 pound Rails, \$25, all f.o.b. Pittsburgh.

**Plates.**—The scarcity in Plates is growing, and they can hardly be had at any price. Repair work is held back on account of inability of Plate mills to make shipments. Prices have gone up about \$2 a ton since our last report, and the minimum of the market to-day on Tank is 1.60c. The tonnage in Plates was never as

heavy as it is at this time. The mills have their product under engagement up to July and later. We quote: Tank,  $\frac{3}{4}$ -inch and heavier, 1.60c.; Flange, 1.70c.; Marine, 1.80c.; Ordinary Fire Box, 2c.; Locomotive Fire Box, 2.75c. Where early delivery is made higher prices can be had.

**Spelter.**—Prices have been practically stationary since our last report, but as soon as consumers come in the market again to buy still higher prices are likely. We quote prime grades of Spelter at 6.40c., Pittsburgh.

**Bars.**—As noted last week one of the largest makers of Steel Bars in the Pittsburgh district are practically out of the market, having their tonnage sold up to July. Prices on Steel Bars have advanced fully \$2 a ton since our last report, and the minimum of the market to-day is 1.25c., Pittsburgh. Demand is very heavy, and all the mills rolling Steel Bars are away behind in deliveries. We quote Steel Bars at 1.25c., Pittsburgh. A recent visit to the Mahoning Valley shows that the mills there are as full of work as they can be, and are operating night and day trying to keep up with orders. Tonnage is very heavy and prices are firm and higher. We quote Iron Bars at 1.15c. to 1.20c., maker's mill. Some very heavy contracts have recently been placed by car builders, and several of the leading Valley mills are reported to be practically sold up to July.

**Pipes and Tubes.**—A radical change has been made in discounts of Pipes and Tubes, and the advance made is equal to about 11 per cent. This matter has been referred to in this report before, the manufacturers having been at work on the new discounts for some time. There is now but one discount for Merchant Pipe, both Black and Galvanized and Butt and Lap Weld. We quote Butt and Lap Weld Black and Galvanized Pipe at 60 per cent. off, with six 10's additional for less than carload lots, f.o.b. maker's mill, and an extra 5 per cent. in carload lots delivered in free districts. These prices were adopted in Pittsburgh on February 22, and have been agreed to by 17 mills, making practically the entire output of Pipe in the whole country. At a meeting of the manufacturers of Oil Well Casing, held in Pittsburgh to-day (Tuesday), an advance of 10 per cent. was made in prices. The demand for Oil Country goods is enormously heavy, and it is no longer a question of price, but where to get material. All the mills are considerably behind in deliveries, and we quote Screw and Socket Joint Casing at 52½ and 10 per cent.; Insert Joint, 52½ per cent., with an extra 5 per cent. to dealers. Prices on Boiler Tubes were again advanced last week at the meeting held in New York on Tuesday, February 21. We now quote  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inch, 50 per cent. off list;  $1\frac{3}{4}$  to  $2\frac{1}{2}$  inch Iron, 60 per cent.; Steel, 65 per cent.;  $2\frac{3}{4}$  to 5 inch Iron, 65 per cent.; Steel, 67½ per cent., with an extra 5 per cent. to dealers.

**Sheets.**—The situation in the Sheet trade is practically the same as noted in this report last week. The demand is abnormally heavy and the mills are turning away tonnage almost every day. It is believed that a consolidation of the Black and Galvanized Sheet mills will eventually be made, but it will take considerable time to accomplish it. Prices are very firm, and none of the mills are accepting orders for delivery beyond July 1. We quote No. 27 Black Sheets at 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c., f.o.b. maker's mill. Some mills, we are advised, are quoting higher figures. Prices on Galvanized Sheets are very strong, and two or three of the leading mills are practically out of the market as sellers for the next two or three months. We quote Galvanized Sheets at 75 and 10 to 75 and 5 per cent., depending on the order. It may be noted that Galvanized Sheets for early delivery have sold at higher prices than the above.

**Merchant Steel.**—Owing to the fact that the Raw Material market is almost bare and prices have been continually advancing since last week, it has necessitated a further advance in Finished Steel. The demand is very heavy and mills are turning away tonnage almost every day unable to make deliveries. We have advanced prices, and now quote as follows: Tire Steel, 3-16 x  $\frac{3}{4}$  inch and heavier, 1.40c. to 1.50c.; Toe Calk, 1.60c. base; Open Hearth Plow Slabs, 3-16-inch and heavier, under 4 inches wide, 1.50c.; Open Hearth Plow Slabs, 3-16-inch and heavier, over 4 inches wide, 1.65c.; Spring Steel, common, 1.50c.; Open Hearth, 1.75c.; Crucible Analysis, 2.50c.; Genuine Crucible, 3.50c.; Machinery Steel, Open Hearth, 1.60c., base; Cant Hook Steel, Open Hearth, 3c.; Cant Hook Steel, Crucible, 3.75c.; Horseshoe Steel, 1.60c.; Lay Steel, rolled, 3c.; Lay Steel, hammered, 3.75c.; Tool Steel, ordinary grades, 5.50c. to 7c.; Tool Steel, best grades, 9c. and upward. These prices are for carload lots, or where a carload is made up of assorted Steels covering the above.

**Iron and Steel Skelp.**—The Skelp mills are full of work and prompt Skelp can hardly be had at any price. We have again advanced prices, and now quote as fol-

lows: Grooved Steel Skelp, 1.20c. to 1.25c.; Sheared Steel Skelp, 1.40c. to 1.45c.; Grooved Iron Skelp, 1.40c. to 1.45c.; Sheared Iron Skelp, 1.50c. to 1.55c., all four months, or 2 per cent. off for cash 30 days, f.o.b. cars, delivered in Pittsburgh district.

**Connellsville Coke.**—Production in the Connellsville region is running at about 170,000 tons per week, and shipments are the heaviest ever known in the history of the Coke trade. There is still a considerable shortage in cars, and much complaint is heard from Coke shippers on this account. The demand for Furnace and Foundry Coke is enormous, and prices are very firm. It is intimated that prices on both Furnace and Foundry may be advanced in a short while. We quote Furnace Coke at \$1.60, and Foundry Coke at \$2 to \$2.30, in tons of 2000 pounds at oven.

The interest of O. M. Hartzell in O. M. Hartzell & Co., commission merchants and dealers in Ores, Metals, &c., has been purchased by Reed T. Blair and James F. Blair, who will continue the business under the firm name of Reed T. Blair & Co., rooms 716-717, Lewis Block, Pittsburgh, Pa.

## Cleveland.

CLEVELAND, OHIO, February 28, 1899.

**Iron Ore.**—The past week has brought few developments in the situation. If judgment be made from the small number of inquiries the supposition would be that furnacemen are pretty well supplied. The committee appointed by the Lake Carriers' Association to take up the matter of night work on docks has made no further move.

**Pig Iron.**—The inadequacy of the supply continues to be emphasized more and more strongly. A sale of Bessemer at Valley furnace was made this week at \$12.50, but it is doubtful if it be possible to secure any more without paying \$13 to \$13.50. Lake Superior Charcoal is quoted at \$14.50 for grades Nos. 1 and 2, and \$15.50 to \$16 for Nos. 3, 4, 5 and 6. No. 1 Foundry has advanced from \$11.75 to \$12.50, and the quotation for No. 2 Foundry has gone up from \$11.50 to \$12.

**Finished Material.**—The week has developed quite an inquiry for Bars, but the mills are, of course, unable to contract for any tonnage of Bars for prompt delivery. For warehouse business at Cleveland Iron Bars are quoted at 1.25c., an advance of 10c. over last week; some quotations on Steel Bars fix a rate of 1.50c., an advance of 25c., while others are closer to last week's quotation. The Otis Steel Company state that they are supplying a few small orders for Plates, and they quote 2c. Flange, if obtainable, would probably show an advance of \$2. and Fire Box an increase of \$4. The Cleveland Steel Company to-day made a quotation of 1.75c. on Tank Steel, an advance of 25c. No. 27 Sheets bring 2.45c. The inquiry for Rails shows that the advance made some time ago is well taken. The quotations on Beams, Angles and Channels show an advance of \$2 per ton, the present quotation being Beams and Channels, 1.50c.; Angles, 1.40c.; Tees, 1.55c., and Zees, 1.50c. The demand for Pipe has not been appreciably affected by the recent change of list. The manufacturers announce that "In order to simplify the discounts on Pipe this list has been compiled with the idea of using one base discount for Standard Black or Galvanized Extra Strong and Double Extra Strong Pipe. The present discount for car lots is 60 per cent. and six 10's and 5 per cent., delivered, off the new list prices, and for less than car lots 60 per cent. and six 10's, no freight allowance.

**Old Material.**—Dealers in Old Material report a heavy increase in demand and express the opinion that buyers are not securing material sufficient for more than immediate demands. Sales have been made at the following: Steel Melting Stock, \$12; No. 1 Wrought, \$14; No. 1 Cast, \$10; Car Wheels, \$15; Cast Borings, \$7, and Turnings, \$8.

## Birmingham.

BIRMINGHAM, ALA., February 27, 1899.

Compared with the week preceding, the market was quieter. The first half of the week was active enough so far as the inquiries were concerned, but there was no encouragement given to buyers, and naturally the activity died away, leaving the last half of the week, the sellers state, as very quiet. There were some representatives of a large buying interest here in person after a big line, but no admissions of success could be obtained. If the furnace interests were so disposed and their condition permitted, sales for any part of the year could be made, easily, to the limit of production. As it is, sales agents are held back with a curb bit, and a considerable element of buyers have tried personal application with poor success. There



is some Iron selling, but comparatively little, and what is booked is at full market price. Gray Forge cannot be had as a rule under \$9, and it takes \$10 to buy No. 2 Foundry. Some No. 2 Soft went at \$9.75, and to some you would be compelled to pay \$9.75 for No. 3 Foundry. It is possible that one might hit a chance opportunity and shade these prices, but it is problematical. The export buying was also very limited. Some interests have, as to deliveries, limited themselves to the quarter just ahead, while others have taken in the whole year. All have booked all they cared to enter. One must not lose sight of the fact that the new Steel mill at Ensley, commencing in July, will take daily 600 to 1000 tons of Iron from the Tennessee Company, as per contract. That is a factor that will affect supply for the open market.

In warrants there is but little, if anything, doing. Some that could have been bought early in the week at \$8.75 are now held at \$9, but the amount is very limited. It is said that the warrants out are held by a comparatively few holders, and some are held as hedges against operations in the line of strict legitimacy, with little probability of their coming out.

It has been stated in these letters that there was no probability of increased output, because of inability, with present facilities, to furnish more Coke and Coal than the furnaces now in blast require. This has led to a close study of the furnace stacks in Alabama and Georgia. They amount to 30, and their location and condition is as follows—viz.:

Coke Furnaces.

Location.	Number in blast	Number idle	Total
Birmingham district	16	5	21
Sheffield	3	1	4
Florence	..	2	2
Ironaton	1	..	1
Briarfield	..	1	1
Fort Payne	..	1	1
	20	10	30

The number under the head "Idle" can be put in condition in time. The eight omitted in above table are antiquated, and to be utilized must be taken down from capstone to foundation. They are obsolete furnaces and all of small capacity.

Of the 11 Charcoal furnaces in Alabama and Georgia but one is in operation as far as we can learn, and there is very little probability of any more blowing in. Their capacity, practically, is all on paper. This statement of conditions is poor comfort to those who point to the number given and their stated capacity. They are just so much brick and iron, gradually yielding to the elements.

So far as stocks are concerned, a trip around the various furnace yards showed "an aching void," and there is no probability of any change in the near future.

The action of the Southern Railroad in practically absorbing the Mobile & Selma Railroad gives us another available, almost air line, road to the Gulf, increasing competition and giving assurance of a constant minimum of freight rates to the seaboard.

At Ensley City each succeeding week shows a material advance toward completion of the great buildings being erected. The main building of the Steel plant, nearly 800 feet long, is completed and is gradually being filled with its outfit of machinery. The Rod mill has let the contract for the 150 horse-power tandem engine to the Birmingham Machine & Foundry Company, who had previously secured other fat contracts. At the rolling mills they are in one continuous rush. The advances made in finished product have not affected demand, and if business is any way slack in any direction new customers from other districts readily absorb it. Their output is frequently wanted before it is ready for the market. The engine shops have secured important orders. The same can be said of the boiler shops. The Brass and smelting shops are simply loaded with business, and the Nut and Bolts works continue behind on orders. Works where sugar machinery is a specialty now anticipate no important business from that source until orders are placed by the West Indies interests, and are turning their attention to miscellaneous business. With a list of over 100 concerns of varied industrial interests in correspondence about removal to this place we have a practical object lesson of the verity of "United we stand, divided we fall."

(By Telegraph.)

The market is stronger, with an active demand, and sales at 25c and 50c. above mail quotations. The demand comes from both large and small buyers and is only partially satisfied.

**The Wire Cloth Makers.**—The wire cloth manufacturers of the United States will hold a meeting at the Iroquois Hotel, Buffalo, N. Y., on March 7. The condition of the wire trade is such as to cause all manufacturers of wire products profound anxiety as to the future, and a meeting of the wire cloth manufacturers will therefore have important matters to consider.

## New York.

Office of *The Iron Age*, 232-238 William street,  
NEW YORK, March 1, 1899.

**Pig Iron.**—The market has been very much excited and a considerable amount of business has been done. Among the most interesting transactions is the sale by a large Steel company, now restricting their operations to high grade work, of a stock of about 50,000 tons of Bessemer Pig to two other Eastern Steel plants at private terms. The heaviest buyers have been the Pipe makers, who have closed for large blocks, close to 20,000 tons, for second half delivery, and some of whose demand is still unsatisfied. In spite of the fact that the market has been jumping, buyers have so quickly, in many cases, taken hold at the new figures that many sellers have now withdrawn altogether. As an instance of what has been going on we may cite the case of one block of about 7000 tons of Iron which has been carried for years. On Saturday it might have been purchased for \$12. On Monday the price was advanced to \$14. An interesting inquiry on which there is some figuring is for a large block of Basic Bessemer Pig for export. The quantity involved is variously reported at 80,000 and 100,000 tons, the delivery to extend over three years. We quote as follows: Lehigh and Schuylkill Irons, No. 1 Foundry, \$14.25 to \$14.50; No. 2 N. \$13.25 to \$13.50; No. 2 Soft, \$13.00 to \$13.25; No. 2 Plain, \$12.75 to \$13, and Gray Forge, \$12.75 to \$13.25. Southern brands are quoted: No. 1 Foundry, \$14 to \$14.25; No. 2 Foundry, \$13.75 to \$14; No. 1 Soft, \$13.75 to \$14; No. 2, \$13.50 to \$13.75, and Gray Forge, \$12.75 to \$13.

**Cast Iron Pipe.**—There have been quite a number of sales of Cast Pipe in moderate quantities. While in isolated cases shops have been offering Pipe at prices based on old cheap Pig Iron contracts, the leading makers are asking a considerable advance, and \$21 to \$22 per gross ton, tidewater delivery, is now quoted.

**Steel Rails.**—The Eastern Rail makers have found it possible to squeeze in only small lots, for which as high as \$24 has been paid. An effort to place a block of about 20,000 tons of Rails for export has been completely fruitless.

**Track Fastenings.**—We quote: Angle Bars, 1.20c. to 1.25c.; Spikes, 1.55c. to 1.60c., and Bolts and Nuts, 1.80c. to 1.90c.

**Finished Iron and Steel.**—There has been a sharp advance in prices all along the line. The market has been active and some very good season contracts for Structural Material have been closed. We note also a sale for export of about 2000 tons of material for the Pacific. The railroads have placed some heavy orders for Bars. We quote as follows: Beams, 1.55c. to 1.65c.; Angles, 1.45c. to 1.50c.; Universal Mill Plates, 1.65c. to 1.70c.; Tees, 1.55c. to 1.60c.; Channels, 1.55c. to 1.60c. Steel Plates are 1.65c. to 1.70c. for Tank, 1.75c. to 1.80c. for Shell, 1.85c. to 1.95c. for Flange, 2c. to 2.10c. for Fire Box, and 2.25c. to 2.50c. for Locomotive Fire Box, on dock. Refined Bars are 1.35c. to 1.40c. and Common Bars are 1.15c. to 1.20c., on dock. Soft Steel Bars, 1.25c. to 1.35c.; Steel Axles, 1.50c. to 1.60c.; Scrap Axles, 1.65c. to 1.75c.; Links and Pins, 1.60c. to 1.65c.; Hoops, 1.35c. to 1.40c.; Best Iron Boiler Rivets, 2.25c. to 2.50c., delivered; Steel Structural Rivets, 1.75c. to 1.85c.; Cotton Ties, 55c. to 65c. per bundle, at mill.

John Leonard, who has been for many years proprietor of the Manhattan Rolling Mill, has formed a co-partnership with Michael Blake, managing partner for the past five years of the well-known firm of M. J. & M. Blake, one of the largest dealers in Scrap Iron in this city. The new firm, under the name of John Leonard & Co., have their office in the St. Paul Building, 220 Broadway, and will conduct a wholesale business in Iron and Steel Scrap, Steel and Iron Rails, Pig Iron, &c.

Alphonse Bouchet, 136 Liberty street, has been appointed Eastern agent by the Dresden Iron & Steel Company of Dresden, Ohio, makers of Black Steel Sheets from No. 14 to 30 gauge, and has also been appointed Eastern agent for their Flat and Corrugated Galvanized Sheets by the Cambridge Roofing Company of Cambridge, Ohio.

The property of the Rome Iron Company, near Rome, Ga., with a large number of acres of mineral lands, is being offered for sale by Geo. H. Webb, Chattanooga, Tenn., trustee for the first mortgage bondholders.

The M. S. Friede Company of 320 Broadway, New York City, have been awarded a contract for the erection and equipment of an entire rolling mill plant from Russia. The company will purchase the entire equipment in this country immediately.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MARCH 1, 1899.

	Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
Am. S. & W., Common.....	418,073	52 -54 <sup>3</sup> / <sub>4</sub>	54 <sup>1</sup> / <sub>2</sub> -59 <sup>1</sup> / <sub>2</sub>	59 <sup>1</sup> / <sub>2</sub> -60	61 <sup>1</sup> / <sub>2</sub> -64 <sup>3</sup> / <sub>4</sub>	59 <sup>1</sup> / <sub>2</sub> -63 <sup>1</sup> / <sub>4</sub>	59 <sup>1</sup> / <sub>2</sub> -62 <sup>1</sup> / <sub>4</sub>
Am. S. & W., Pref.....	78,089	95 -97	97 -99 <sup>1</sup> / <sub>2</sub>	98 <sup>1</sup> / <sub>2</sub> -100	99 -101 <sup>1</sup> / <sub>2</sub>	99 <sup>1</sup> / <sub>2</sub> -102 <sup>1</sup> / <sub>4</sub>	100 <sup>1</sup> / <sub>2</sub> -101 <sup>1</sup> / <sub>4</sub>
Col. Fuel and Iron.....	3,535	33 <sup>1</sup> / <sub>2</sub> -34 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub> -34 <sup>1</sup> / <sub>2</sub>	33 -34	33 <sup>1</sup> / <sub>2</sub> -34 <sup>1</sup> / <sub>2</sub>	-33 <sup>1</sup> / <sub>2</sub>	-32 <sup>1</sup> / <sub>2</sub>
Federal Steel, Common.....	201,054	50 <sup>1</sup> / <sub>2</sub> -52	50 <sup>1</sup> / <sub>2</sub> -53	51 -52 <sup>1</sup> / <sub>2</sub>	51 <sup>1</sup> / <sub>2</sub> -53 <sup>1</sup> / <sub>4</sub>	51 <sup>1</sup> / <sub>2</sub> -53 <sup>1</sup> / <sub>4</sub>	50 <sup>1</sup> / <sub>2</sub> -52 <sup>1</sup> / <sub>4</sub>
Federal Steel, Prefer.....	73,934	87 <sup>1</sup> / <sub>2</sub> -88 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub> -89 <sup>1</sup> / <sub>2</sub>	87 -88 <sup>1</sup> / <sub>2</sub>	87 <sup>1</sup> / <sub>2</sub> -89 <sup>1</sup> / <sub>2</sub>	88 <sup>1</sup> / <sub>2</sub> -90	87 <sup>1</sup> / <sub>2</sub> -88 <sup>1</sup> / <sub>2</sub>
Tennessee Coal and Iron.....	54,335	44 <sup>1</sup> / <sub>2</sub> -46 <sup>1</sup> / <sub>2</sub>	45 -46 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>2</sub> -46 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>2</sub> -46 <sup>1</sup> / <sub>2</sub>	44 <sup>1</sup> / <sub>2</sub> -46	44 -45
Cambria Iron, Phila*.....	1,797	45 <sup>1</sup> / <sub>2</sub> -45 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub> -46	45 <sup>1</sup> / <sub>2</sub> -46	-46	46 -46 <sup>1</sup> / <sub>2</sub>	46 -46 <sup>1</sup> / <sub>2</sub>
Cambria, Scrip**.....							
Cambria, Steel***.....	120,270	18 <sup>1</sup> / <sub>2</sub> -19 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub> -19 <sup>1</sup> / <sub>2</sub>	19 <sup>1</sup> / <sub>2</sub> -20	19 <sup>1</sup> / <sub>2</sub> -20 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub> -21 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>2</sub> -20 <sup>1</sup> / <sub>4</sub>
Penna. Common, Phila.....	6,470	32 <sup>1</sup> / <sub>2</sub> -33 <sup>1</sup> / <sub>4</sub>	35 -37	37 <sup>1</sup> / <sub>2</sub> -40	39 <sup>1</sup> / <sub>2</sub> -40	39 -40	-40
Penna. Prefer., Phila.....	604	-55	57 -57 <sup>1</sup> / <sub>2</sub>	59 -60		60 -61	-60
Tin Plate Common, New York..	29,295	39 <sup>1</sup> / <sub>2</sub> -40	39 <sup>1</sup> / <sub>2</sub> -42 <sup>1</sup> / <sub>2</sub>	42 -43 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub> -43	40 -41 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub> -40 <sup>1</sup> / <sub>2</sub>
Tin Plate Preferred, New York.	1,700	-93	93 -93 <sup>1</sup> / <sub>2</sub>	-95	94 <sup>1</sup> / <sub>2</sub> -95	94 <sup>1</sup> / <sub>2</sub> -95 <sup>1</sup> / <sub>2</sub>	94 -94 <sup>1</sup> / <sub>2</sub>
Tin Plate Com., Chic.....	27,064	38 <sup>1</sup> / <sub>2</sub> -39 <sup>1</sup> / <sub>2</sub>	38 <sup>1</sup> / <sub>2</sub> -42	41 <sup>1</sup> / <sub>2</sub> -42 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub> -41 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>2</sub> -41 <sup>1</sup> / <sub>2</sub>	39 -40
Tin Plate Prefer., Chic.....	3,048	92 -92 <sup>1</sup> / <sub>2</sub>	92 -92 <sup>1</sup> / <sub>2</sub>	94 -94 <sup>1</sup> / <sub>2</sub>	94 <sup>1</sup> / <sub>2</sub> -95	94 -95	94 -94 <sup>1</sup> / <sub>2</sub>
National Steel Common, Chic..	25,304		26 -27 <sup>1</sup> / <sub>2</sub>	30 -35	35 -39 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>2</sub> -39	34 <sup>1</sup> / <sub>2</sub> -37
National Steel Preferred, Chic..	17,095		83 <sup>1</sup> / <sub>2</sub> -85	82 <sup>1</sup> / <sub>2</sub> -85 <sup>1</sup> / <sub>2</sub>	85 -88 <sup>1</sup> / <sub>2</sub>	86 <sup>1</sup> / <sub>2</sub> -89	85 -87

\* Par \$50. \*\* Par \$100. \*\*\* \$1.50 per share paid in

Late Philadelphia and Chicago sales by telegraph.

Metal Market.

Office of The Iron Age, 232-238 William street, NEW YORK, March 1, 1899.

**Pig Tin** — Has gone off just a shade and is quoted to-day 24c. March quotations are given as 23.87<sup>1</sup>/<sub>2</sub>c. and 23.75c. is the price named for April. The market here was very quiet, and transactions small and not numerous. London cables announced £107 16s. 3d. for spot and £107 13s. 9d. for three months' futures. The market was stated to be firm. These prices show a falling off during the month, as the London cables on February 2 were £114 2s. 6d. for spot. Fluctuations during the month of February were very violent, but the higher range of values was well maintained. Arrivals at the Atlantic ports were fair, the bulk coming in toward the close of the month. Deliveries were large, nearly all being shipped direct from steamers landing. Shipments from the Straits increased considerably during the month of February, and the total for the month now shows an increase of 550 tons above the same period of last year. The visible supply for the United States shows a decrease of 440 tons in spot stocks, while the afloats have increased 1645 tons during the month. Most of the spot stock is on steamers landing, and as the arrivals during the next fortnight will not be large, apparently the premium on spot will easily be maintained.

**Copper.** — The market remains quiet and in Lake it is lifeless. Quotations for Lake Superior Ingot are necessarily nominal, as it appears to be about impossible to purchase any large amount of this metal. The price which is quoted to-day for Lake is 17.75c. to 18c. Electrolytic Cakes, Wire Bars and Ingots are quoted at 17.50c. to 17.75c. There seems to have been just a slight indication of a picking up of the demand toward the close to-day. Casting Copper is quoted 17c. to 17.25c. London closed with £71 13s. 9d. for spot and £71 11s. 3d. for three months' futures. Best Selected came £76 10s. These figures are £6 3s. shy of last week. Exports from the Atlantic ports during the last month were small, the total for the first two months of this year showing a falling off of 6513, as compared with the same period of last year. The exports of domestic Copper from New York and Baltimore for the month of February, as per custom house returns and compiled by the exchange, were as follows:

From New York.....	3,438 tons Copper.	157 tons Matte.
From Baltimore.....	2,670 tons Copper.	... tons Matte.

Totals..... 6,108 tons Copper. 157 tons Matte.

Reducing the Matte at 55 per cent. into fine Copper, the total exportation for February amounts to 6194 tons of 2240 lbs.

During the same month the following arrived at this port:

From Europe.....	540 tons Ingots, &c.
From Mexico.....	575 tons Bars.
From Mexico and Europe.....	88 tons Matte and Ore.

Total exports since January 1, 1899, exclusive of Southern ports for February.....	Tons, 13,674
Against same period in 1898.....	20,187

**Pig Lead.** — This metal went off about 10c. since our last report. There has been little inquiry from any quarter for larger than carload lots, and even calls of this size were very limited. The market closed to-day very dull, with prices 4.30c. to 4.35c. The latest telegram from St. Louis announced the market there unsettled and easier, consumers claiming free offerings at 4.10c. Spot Soft Spanish was quoted £14 at the close to-day. Arrivals at this port were about 5600 tons from Mexico, 50 tons from Spain, 25 tons from England. Exports in bond from Atlantic ports amounted to 3468 tons of 2240 pounds.

**Spelter** — Has come down considerably and closed to-day 6.25c. to 6.50c. for spot. March and April were quoted 6.25c. to 6.35c. Business here is moderate and only a small quantity of the metal has changed hands during the last week. London cables £27 15s. for G. M. B. Exports from Atlantic ports, according to the exchange, were 50 tons Spelter, 1906 tons Spelter Ores.

**Antimony** — Remains unchanged with Hallett's strong at 10c. and Cookson's scarce at 10c. to 10<sup>1</sup>/<sub>4</sub>c.

**Nickel.** — There has been an increased demand and the position is very strong, especially on small lots. Prices are unchanged, quotations ranging from 38c. to 40c., according to quantity and delivery.

**Tin Plates.** — The American Tin Plate Company have ceased quoting. Deliveries of previous orders will be made, but the company have refused to quote on any future business. It is claimed that the company can obtain no bars, and although negotiations are pending with the National Steel Company for a supply thus far they have been unable to get any of the constituent companies to sell any quantity. We quote wholesale price J. B. grade American Tins, regular sizes, with usual differences for odd sizes:

	F.o.b. New York.
Bessemer Steel, full weight.....	\$3.81 <sup>1</sup> / <sub>2</sub>
Bessemer Steel, 100 lbs.....	3.69
Bessemer Steel, 95 lbs.....	3.64
Bessemer Steel, 90 lbs.....	3.59
Bessemer Steel, 85 lbs.....	3.54
Bessemer Steel, 80 lbs.....	3.49
Charcoal Ferne, same delivery—	
20 x 28, ordinary.....	6.34

Iron and Industrial Stocks.

American Steel & Wire stocks have been the feature of the week, rising under heavy sales. The upward movement is reported to be due to the heavy earnings of the company. A large business was done in Federal Steel and in Tennessee Coal, Iron & Railroad. All the repeated reports of a grand consolidation of the steel properties have absolutely no basis in fact. It is believed that when the Alabama steel and wire plants have proved their capacity to produce cheaply and to market product, the American Wire Company may acquire an interest, which would react favorably upon Tennessee stock. We print this week, for the first time, the quotations for the National Steel issues, which have started very well in Chicago.

In Philadelphia there has been a very heavy movement, at an advance in prices, in Cambria Steel.

The tin plate issues have not been very active, either in New York or in Chicago.

The following are recent quotations on outside stocks:

International Silver, Common.....	31 <sup>1</sup> / <sub>2</sub> to 32 <sup>1</sup> / <sub>2</sub>
International Silver, 5s.....	.. to ..
Mich.-Peninsular Car, Common.....	44 to 46
Mich.-Peninsular Car, Preferred.....	102 to 103
Mich.-Peninsular Car, First 5s.....	100 to 103
Otis Elevator, Common.....	39 <sup>1</sup> / <sub>2</sub> to 40 <sup>1</sup> / <sub>2</sub>
Otis Elevator, Preferred.....	90 to 90 <sup>1</sup> / <sub>2</sub>
H. R. Worthington, Common.....	40 to 41
H. R. Worthington, Preferred.....	104 to 106
Cramp's Shipyard Stock.....	79 to 80
Pratt & Whitney, Common.....	3 to 6
Pratt & Whitney, Preferred.....	40 to 50
E. W. Bliss, Common.....	133
E. W. Bliss, Preferred.....	125
U. S. Projectile.....	90 to 95
Barney & Smith Car, Common.....	22 to 24
Barney & Smith Car, Preferred.....	.. to ..
Pressed Steel, Common.....	67 to 67 <sup>1</sup> / <sub>2</sub>
Pressed Steel, Preferred.....	88 <sup>1</sup> / <sub>2</sub> to 89

Pressed steel shows a further rise.

A. S. Hay of Naylor, Benzon & Co., London, and Naylor & Co., New York, is expected on the "Majestic," which is due to-day.



## The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, }  
New York, March 1, 1899. }

In every line of the machinery trade the month of February has been most prosperous. Demand has been good, prices stiffened and matters brought to the surface, which means continued activity. There have also been several unusually large purchases made, the largest of which was for the equipment of the new car works to be erected at McKees Rocks, Pa., by the Pressed Steel Car Company of Pittsburgh. This transaction amounted to about \$700,000 in machinery lines. Full details are given in another column.

Another large contract recently awarded was given to the Frank-Kneeland Machine Company of Pittsburgh by the National Enameling & Stamping Company of St. Louis. The contract is for the erection and equipment of an entire metal ware stamping plant. The cost of the plant complete, it is said, will reach \$1,000,000. The plant will be situated in Granite City, Mo., the buildings covering nearly 4 acres. The Frank-Kneeland Machine Company are now subletting contracts for those portions of the equipment which they do not build. They have given the boiler order to the Heine Safety Boiler Company of St. Louis and 11 Broadway, New York. The installation will consist of eight 275 horse-power boilers. We understand that they are to be equipped with automatic stoking machines, and that the machinery throughout the plant will be electrically driven.

The Niles Tool Works Company, who have been the largest dealers in electric traveling cranes in the country, have had them built for a number of years at Alliance, but this arrangement having proved unsatisfactory they are now building the machines themselves. They find that work done under one's own hand is the only work that can be depended on in every way, especially in point of delivery, and cranes, above almost any other machine, must be ready when the building is prepared to receive them so that they may be available for installing the rest of the plant, whatever it may happen to be. The Niles crane is the same as heretofore, double web, box section girder, and box end carriages, the trolley running on the top of the bridge, together with standard electrical equipment, which is really the life of the crane. Their main office and salesroom, together with that of the Pond Machine Tool Company, is at 136 Liberty street, New York.

The Prentiss Tool & Supply Company of 115 Liberty street have purchased the entire equipment of Beckett & McDowell of Arlington, N. J. The latter concern were builders of Corliss engines and crushing machinery. The plant consisted of about 50 modern tools which the Prentiss Company will sell through their second-hand department.

Promoters of consolidations are said now to be invading various lines kindred to the machinery interests. They are said to be at the manufacturers of gate valves, and among the concerns named as having been approached on the subject are the Ludlow Mfg. Company, the Chapman Valve Mfg. Company, the R. D. Wood Company, the Pratt & Cady Company, the Michigan Iron & Brass Company, and the Crane Company of Chicago. The bolt and nut manufacturers are trying to formulate some form of agreement, and the steam pump builders are still working toward the same end.

Boston tube manufacturers have issued a card to the trade announcing an advance of 10 per cent. on all their products. This further tends toward an advance in boilers. The return tubular builders are keeping abreast with every advance in material, and the water tube builders have further stiffened their prices.

There are reports going the rounds to the effect that the Cramp & Sons Ship & Engine Building Company have authorized an issue of \$1,500,000 of 5 per cent. bonds for the purpose of building a large dry dock. It is also stated that about two-thirds of the issue will be needed to withdraw bonds now outstanding.

We are informed that specifications are now being prepared for the annual purchase of gates, valves, hydrants and fittings for the Water Department of New York. Commissioner Dalton's office is at 150 Nassau street. Bids will be asked in about two weeks.

There is a movement on foot which contemplates the laying of a \$2,000,000 water main from the Croton watersheds to Brooklyn, the mains to be laid under the East River. The Brooklyn and Long Island supply will be inadequate in the near future, and this is but one of the schemes suggested. About \$100,000 worth of piping will also be specified for within about two weeks.

The Board of Education of New York will spend about \$3,152,712 for new schools and additions. Of this about \$297,560 will be expended for heating and ventilating apparatus. Specifications are now being prepared.

A scheme which it is said is favored by Governor Roosevelt contemplates the establishment of a State electric light plant. The question is now before the Capitol

Trustees and Senator Higgins, Chairman of the Senate Finance Committee, is also at work on the subject.

M. Sergen Friede, president of the M. S. Friede Company of 329 Broadway, New York, Vladivostok and St. Petersburg, arrived here last Saturday from an extended trip through England and the Continent. M. Friede has been purchasing a large amount of machinery and material for the construction of the Chinese Eastern Railway. That which he purchased in Europe was of a nature which could not be supplied here advantageously. He also received several large new contracts which he will fulfill immediately. As much of this material as possible will be purchased in this country. He is now in the market for an entire equipment of track laying machinery, latest railroad implements and machinery for gradings and balastings. Bids are now being received. Mr. Friede has just placed an order in this country for a complete outfit for wire drawing. The machinery will be used in European Russia. On March 17 Mr. Friede will start across the continent, and on the 25th leave San Francisco for Manchuria.

### Construction Notes.

Arrangements are progressing for the removal of the entire plant of the Page Woven Wire Fence Company of Adrian, Mich., to Monessen, Pa. Contracts have been let for the erection of buildings on an 18-acre site recently purchased for \$27,000. The Pittsburgh & Lake Erie Railroad will begin to lay switches this week, and all plans for the arrangements of the shops have been completed. It is intended to double the capacity of the works with the new plant. Arrangements may be made for the erection of a wire mill in the neighborhood of the new works, the Page Company agreeing to buy the entire output of the mill. Heretofore the company have purchased the wire used. Considerable new machinery will doubtless be required by the company.

We understand that contracts have been awarded by the Tyler Tube Company for an enlargement of the works at Washington, Pa. The Fort Pitt Bridge Company received the contract for the building, and the A. Garrison Foundry Company of Pittsburgh will furnish an 18-inch train of rolls. A 500 horse-power power plant will be installed.

H. G. Wasson of the Park Building, Pittsburgh, is said to be arranging for the construction of a seamless tube mill at Beaver Falls, Pa. The new plant, it is said, will have an equipment of 40 machines and all necessary apparatus. Tubes will be drawn up to 6 inches diameter. It is stated that the old Duquesne Tube Works plant has been purchased from the Carnegie Company for the main building of the new plant. It is now being dismantled prior to removal to Beaver Falls. Plans are now being drawn for the auxiliary buildings, which will consist of machine shop, power house and warehouses.

The Bass Foundry and Machine Company of Fort Wayne, Ind., and 141 Broadway, New York, were awarded the contract for the 2000 horse-power cross compound condensing engine which is to be installed in the central power plant of the Armour Packing Company, at Kansas City.

Considerable new machinery, consisting of high class machine tools of a smaller nature and coining machines will be ordered shortly for the new Philadelphia Mint. Among the machinery already ordered are included a 14 x 6 inch screw cutting and engine lathe, a 28-inch extension lathe and an 8-inch precision lathe with attachments; also a drill press and three electric motors. Among the coining machines ordered are a 10x9 inch rolling mill, a coining press and three cutting presses. A gas plant is to be installed and a gas annealing furnace put in the old building; the rolling mill will also be enlarged. As the new mint will not be ready for occupation for some time, as much new machinery as is necessary will be installed now in the old building, and when the new building is completed the machinery will all be removed. Superintendent Boyer is making the purchases.

All of the bids for the construction of the boat house and armory for the United States Naval Academy, Annapolis, ran above the appropriation of \$600,000. P. J. Carlin of New York was the lowest bidder with \$750,000. The other bids were: John Gill & Son and D. W. Thomas of Baltimore, \$820,323; Grace & Hyde, New York, \$855,000; William H. Ellis, Cincinnati, \$835,000; the Structural Iron Company of Baltimore, \$976,000, and Woodbury & Leighton, Boston, \$840,000.

The contract for the 15,000,000-gallon triple expansion pumping engine for the Calumet & Heckla mines was awarded to the Snow Steam Pump Works.

Bids are asked until March 31 for furnishing and installing at high service pumping station No. 1, St. Louis, Mo., three vertical triple expansion crank and fly wheel condensing pumping engines, the estimated cost of which is \$300,000. The specifications are in charge of Robert E. McMath and E. S. Foster, respectively presi-

dent and secretary Board of Local Improvements, St. Louis.

The Buffalo Forge Company sold through their New York office, 26 Cortlandt street, two exhausters, with blast wheels 14 feet diameter by 7 feet wide, each direct connected to a 15 x 15 inch horizontal class II engine running in oil to the Campana Metalurgica Mexicana for San Luis Potosi, Mexico, Smelting Works. The heating apparatus for Hamilton Hall, New York, also went to the Buffalo Forge Company. C. C. Haight is the architect and Baker, Smith & Co. the engineers on the latter deal.

## The Chicago and Northwest Machinery Market.

Office of The Iron Age, 805 Fisher Building, 1  
CHICAGO, February 27, 1899.

Reports from many prominent manufacturers in Chicago and the Northwest show that the machinery trade during February was larger than at any time since 1892. Not only have orders been booked for some time ahead, but works are running night and day in order to make deliveries on time. The time question has influenced trade, and in some cases orders have been refused because of no stock on hand and there was not time enough to build. Inquiries have almost always been for quick shipments, the purchasers having urgent need of the machines.

The foreign demand has shown a steady increase along the whole line. This has been particularly the case in England, the inquiries from Russia being the result mainly of railroad building there. The tools finding a market abroad are in almost every instance those of standard patterns, which have already won a standing for themselves here.

The Edward P. Allis Company, Milwaukee, Wis., received a number of large orders during February, among the more important being five vertical cross compound blowing engines for Laughlin & Co. of Pittsburgh. These engines are similar to the ones furnished to the Oliver & Snyder Steel Company, Aetna-Standard Iron & Steel Company and Carnegie Steel Company. Each of the machines weighs approximately 350 tons. The South Side Elevated Railway Company of Chicago have placed an order for two more cross compound engines for their station. The new engines drive 1600 kilowatt generators. The McCormick Harvesting Machine Company of Chicago have placed an order for four large compound engines of about 1500 horse-power each. A large direct coupled engine has been ordered by the Altoona & Logan Valley Street Railway Company of Altoona, Pa. They have also received an order for another engine to go to the tramways of Buenos Ayres, Argentine Republic. This machine is a duplicate of the three compound engines shipped to Buenos Ayres about a year ago. They have been compelled to decline a large number of orders, as it is impossible to make the delivery asked for. About the usual number of lesser orders have come to hand.

The Anderson Foundry & Machine Works, Anderson, Ind., made a very nice shipment of brick machinery to New Zealand in the past month.

The Stover Novelty Works, Freeport, Ill., have removed to the corner of Spring and Liberty streets, where they have more room, which they needed very badly, as their business is increasing so rapidly that they had outgrown their old plant. The outlook for the future is still more encouraging, they having recently taken several large contracts for special wire working machinery. They further have a number of inquiries from large concerns whose orders they hope soon to receive. It is gratifying to be able to state in connection with this that they have received orders at a higher price than their customers were quoted by some competing concerns. They have just received several samples from parties in Europe for special wire forming machinery. Both their domestic and foreign business is constantly increasing.

The Union Steam Pump Company, Battle Creek, Mich., have observed no perceptible slackening up, but on the contrary everything seems to be gaining. They are enjoying a larger business than last year at this time; their customers seem to be satisfied, money seems to be easy and people pay their bills promptly. Their foreign business is quite as good as it has been, and although making no special effort in that direction it is increasing.

The Walburn-Swenson Company, Chicago, Ill., say that business with them is very good indeed. They have booked a large number of orders for their specialties in evaporating machinery, as well as for a large number of cotton presses, and are running their factory day and night to its fullest capacity. The foreign inquiry for their multiple effect evaporators is excellent, and they look for a large export trade this year.

The Gates Iron Works, Chicago, report that business for February in their line continued to be good, and they have more orders on their books now than they have ever had at any one time in all their history.

Joseph T. Ryerson & Son, Chicago, who are prominent

in furnishing tools and machinery to boiler makers, report a general movement of the trade toward buying tools under the pressure of an enlarging business. It has not taken the form of any very large purchases or outfits for new enterprises, but is the outcome of increasing the productive capacity of already existing plants.

The Northwestern Elevated Railroad Company have commenced to drive piles for the foundation for the power house by which the road will be electrically operated. It will be located on the north side of Fullerton avenue, just east of Southport avenue, and will be about 3000 feet west of the railroad structure. The building will cost only \$90,000, but the whole improvement, including structure and equipment, will cost \$400,000. It is the intention to have it completed to go into operation in August. The building will front 112 feet on Fullerton avenue, extending back a depth of 255, and will be 50 feet high. The exterior will be constructed of brick and iron, with concrete roof. There will be a smoke stack 15 feet in diameter and 205 feet high. The equipment will include three engines of 2000 horse-power each and one of 1000 horse-power, connected direct with generators of the same capacity. There will be 12 boilers of 400 horse-power each. The supply of coal for fuel will be received over a track built for that purpose connecting with the Evanston division of the St. Paul Railroad.

The Murray Iron Works Company of Burlington, Iowa, have the following orders on their books: Corliss engines—one 60 horse-power, one 150 horse-power, one 100 horse-power, one 400 horse-power, one 300 horse-power, one 200 horse-power and one 50 horse-power. Boilers—two 100 horse-power high pressure, three 200 horse-power internal furnace, one 100 horse-power internal furnace, three 125 horse-power high pressure and three 100 horse-power high pressure; also one 50 horse-power portable, one 40 horse-power portable and one 30 horse-power portable. Mining machinery—two 50 horse-power mine boilers and two mining engines. One yacht engine and boiler and one refrigerating machine.

The Charles F. Elmes Engineering Works, Chicago, are enjoying an exceedingly good business, and the prospects for the future are very encouraging. They have placed an order for more tools on account of the demand for machinery in their line.

Williams, White & Co. of Moline, Ill., have received three orders for their No. 7 bulldozers. These are the heaviest bulldozers they build, weighing 25 tons each. Two of them are going to Pittsburgh and one to Easton, Pa. Two of them are to have steam engines attached, and the other is to be used with an electric motor. The one to be used with the motor is for the Westinghouse people.

Rudolphi & Krummel of Chicago report that the demand for presses and sheet metal working machinery has continued very satisfactorily, the orders being, however, mostly scattered and comparatively small. An automatic bolt cutter, with which experiments have been made for some time, has been perfected and will be placed on the market soon. A number of orders were taken for equipping motor vehicle factories with armature disk presses and dies.

W. H. Bullock Mfg. Company of Chicago state that the activity in general lines of business has extended to the machinery trade, so far as they can judge from orders booked since the first of the month. That the demand for machinery is not confined to one line or territory is evident from their having received orders during last month for central valve engines from Colorado, diamond drills from Canada and Pennsylvania, Champion mine ventilators from Japan and Canada, and some special machines to be built for local concerns. The outlook for future orders, judging from inquiries in hand, has not been better since 1892.

The Vilter Mfg. Company of Milwaukee are operating their works day and night in order to meet the demand. They have recently secured some very fine contracts in the southeastern and southern sections of the country for large ice making and refrigerating plants, including Corliss engines for all and boilers for some of the plants. In Missouri, Ohio and Iowa they have secured orders for refrigerating and ice making machinery, and the past week they have been awarded contracts for a number of their compound condensing Corliss engines of girder as also heavy duty type here and in the South. The past month has been the best one on record with them.

The business of the Chicago Pneumatic Tool Company shows a gratifying increase both at home and abroad. Their president, J. W. Duntley, has recently returned home from his sixth trip to Europe within three years, and after having made a two months' trip throughout Great Britain and the Continent he reports from their London house a very rapid extension in the demand for their pneumatic tools, with inquiries that show that this rapid extension is likely to increase very much. Their tools are in use throughout the entire civilized world and they can now furnish references from all points. An exhibition of the tools of this company was recently held in Glasgow. Their design and operation were commended in the highest



terms by shipbuilders, locomotive builders, boiler makers and eminent engineers. They have a letter from W. F. Dickson, chief engineer of the Sornovo Locomotive Company in Russia, in regard to arranging for the sale of their specialties in that country. He says: "We have obtained such good results from the various Boyer tools in our shops and they have attracted so much favorable comment that a large business could be done, with arrangements for proper representation here."

### The Cincinnati Machinery Market.

Office of *The Iron Age*, Pickering Building,  
CINCINNATI, OHIO, February 27, 1899.

The conditions which were mentioned in the last few monthly letters from this point regarding the multiplicity of orders and the oversold condition of most of the shops has been intensified rather than lightened; so far as it comes to the observation of your correspondent there is not a shop used for the manufacture of iron working machinery which is not crowded beyond its present capacity to handle. Domestic business shows a very decided improvement and foreign orders show no signs of decreasing. A few wood working machinery shops also report business as on the increase, though in the main this branch of tool manufacture does not keep pace with the activity in the other line.

The Halls Safe Company, who are the newest concern in this branch of business in this city and whose members were chiefly drawn from the old Hall Safe & Lock Company's force, report business as exceedingly brisk. Domestic trade, they say, is excellent, and their salesman in the Orient is placing large orders in China and India. Mexico and the Argentine Republic are also sending in orders at a lively rate. Their St. Petersburg agent has also booked some very heavy contracts recently. The capacity of the shops is about 30 safes per diem and orders are coming in pretty nearly at the rate of 50.

The American Tool Works Company are now running very smoothly under the new régime. The company are officered by Franklin Alter, president; J. V. Lewis, vice-president and general manager; L. E. Voorheis, assistant manager; A. E. Robinson, superintendent; Henry Lewis, secretary and treasurer. The Board of Directors is composed of Franklin Alter, A. B. Voorheis, T. P. Egan, Robert Laidlaw and J. V. Lewis. Mr. Lewis reports everything that is good regarding the business, both domestic and foreign, with but few contracts or shipments sufficiently out of the ordinary to merit special mention. It might be well, however, to remark that the company are keeping up their record in regard to technical school equipments in this country as well as abroad. The order books of the past few years show that dealings have been had with quite a number of educational institutions. They have just secured a contract for the equipment of the shops of the new technical school at Calumet, Mich. This school is being founded and equipped by the Calumet & Hecla Mining Company, and the order comes direct from that concern to the American Tool Works and amounts to 14 assorted machine tools, which are to be shipped and put in running order as soon as practical. They have also received a large machine tool order from the Tulane Technical School in New Orleans, La.

The J. A. Fay & Egan Company have just declared their regular annual dividend, and at the directors' meeting recently it was reported that the company had set up within the past year \$100,000 worth of new iron working tools in their Cincinnati shops, all this to enable them to compete with market conditions, which have within the past few years shown such a decided change. They report a very decided improvement in the furniture and chair districts in the South, notably in North and South Carolina, also considerable activity in the Southern saw mill districts, and within the past month quite an inquiry and considerable ordering from Northwest planing mills. They regard the outlook for an active year as better than any in the past six or seven.

### The Naval Appropriation.

WASHINGTON, February 28, 1899.—The House of Representatives on the 23d ult. passed the Naval Appropriation bill after a notable debate which resulted in the complete remodeling of the most important provisions of the measure—those dealing with the proposed increase in the navy. The chief amendments made to the bill, as reported, include the striking out of the provision limiting bids to firms already possessing adequate plants, and the provision limiting the number of vessels to be constructed by a single firm, and the reduction of the limit of price for armor plate from \$545 per ton, as reported by the committee, to \$445. The action of the House was a great disappointment not only to the Naval Committee, but to the Navy Department, and the proceedings throughout the debate served again to emphasize the inability or unwillingness of members of the House to familiarize them-

selves in any degree with the technical subjects which they undertake to discuss authoritatively. Many features of the discussion have a special interest for the readers of *The Iron Age*, and are therefore presented briefly below.

When the House reached the provision for the increase of the navy which authorized the construction of three battle ships, three armored cruisers and six protected cruisers the opposition to the Naval Committee rapidly developed, and for three days the House wrangled over a single page of the measure. Representative Dockery of Missouri raised the first objection to the measure, making the point of order that the provision excluding bidders not already provided with plants was in the nature of new legislation and therefore subject to being ruled out on objection. Chairman Boutelle inquired as to the basis of Mr. Dockery's objection to the provision, whereupon that gentleman stated that he was opposed to it for the reason that "the effect is to limit this business to the Carnegie Company and the Bethlehem Company." He added that if there were a dozen companies already possessed of plants he would not feel like urging the objection. Chairman Boutelle with some emphasis corrected Mr. Dockery's statement, pointing out that neither the Carnegie nor the Bethlehem Company have anything to do with contracting for war vessels except to furnish armor for them. Mr. Dockery thereupon asked to be informed what firms did engage in the building of war ships, to which Mr. Boutelle replied: "Anybody with big plants; firms at Wilmington, at Baltimore, at Bath, at Philadelphia, at Newport News, at San Francisco and all over the country." Mr. Dockery at once rejoined: "The principle of this provision is vicious; it is exceedingly obnoxious. It limits the bidding to plants already in existence, and is therefore a change of existing law. If, however, it is existing law, as a matter of principle it would be reprehensible; but not being existing law, and inaugurating, as I view it, a policy which will tend to build up trusts in this particular line of work, I am constrained to insist upon the question of order. I am opposed to trusts and to all legislation which tends to encourage combinations, thus making it inevitable that competition will be destroyed."

In opposing Mr. Dockery's point of order, Chairman Boutelle called attention to the fact that Congress had heretofore incorporated an identical provision concerning the construction of torpedo boats. As to the merits of the question, he said: "Under the operation of this provision in the past war vessels have been bid for by shipbuilding firms all over the country, and the object of this provision is not to restrict competition but simply to secure prompt work. It does put an obstacle in the way of speculators who might want to put in bids for gigantic operations that they know they could not execute, as in the case of the Illinois Steel Company a year or two ago, when they held the House and Congress and the United States Government up for two years or so in procuring armor for its ships on a bogus proposition put in here and used as a bugaboo to scare Congress away from a common sense duty. But it was not to prevent a fair and equitable competition, which will enable us to get the best ships in the world constructed at a fair and equitable price. No man can prepare a plant for this purpose in much less time than two years. Any gentleman who has attended the launching of these great battle ships and seen the facilities required to construct them cannot have failed to observe the enormous character of the requisites for facilities for building one of these great battle ships. No man will pretend that he can begin on the ground and get up a plant adequate to commence the great battle ship or an armored cruiser inside of two years or more. I contend, and the committee hold, and I am quite sure this House will hold, that in making contracts, with all the facilities we have developed in this country from the Pacific to the Atlantic, from far Northern Maine down to Fortress Monroe—with all these magnificent facilities which we possess to-day, we have a right to demand, when we put our contracts for ships which we want as soon as we can reasonably get them, and for which we have the money to pay—we have a right to demand that the propositions submitted for their construction shall have with them the guarantee of good faith—something which will show that the men who ask these contracts have the facilities for building the ships."

In reply to questions from other members Mr. Boutelle emphasized the fact that although a contractor might forfeit his bond to the Government, nevertheless the ship would not be built until another contractor had had time to construct it. The Government, he said, did not want forfeited bonds, but did want ships. When the point of order was finally submitted to the chair it was ruled to be well taken on the purely technical ground that last year's Naval bill had applied the proviso under discussion solely to torpedo boats; hence the proviso in the present bill must be regarded as "new legislation," which is forbidden by Rule XXI. of the House to be incorporated in an appropriation bill.

When this question had been disposed of Representative Hopkins of Illinois made the point of order against the proviso to the effect that "not more than two of said

battle ships and not more than two of said armored cruisers and not more than two of said protected cruisers shall be built in one yard or by one contracting party." Mr. Hopkins urged that there was no general law authorizing the restriction quoted and maintained that the fact that Congress had previously enacted a similar provision made no difference, as all such provisions applied to the special bills under consideration and would have been amenable to the point of order if any one had seen fit to raise it. On this presentation the Chair sustained the point of order and ruled the provision out.

Representative Rixey of Virginia thereupon offered an amendment striking from the bill the provision for six protected cruisers of 2500 tons displacement each, which was stoutly resisted by Chairman Boutelle, who pointed out that there would be great economy in building these comparatively small cruisers which could be maintained at much less expense than battle ships, and which would be sufficiently powerful to carry the American flag in numerous regions where the United States had interests that required protection. "I am sure," said Mr. Boutelle in conclusion, "that the list of vessels proposed in this measure is an exceedingly modest one in comparison with the general expressions that have been flying through the air in the summer, fall and winter in reference to the building up of our navy upon which we relied so successfully last year." When the vote was taken on Mr. Rixey's amendment but 16 members favored it, and it was therefore rejected.

When the provision for armor was reached a dozen members rose simultaneously to address the Chair, giving ample evidence that the recommendations of the committee would meet with stubborn opposition. Mr. Hopkins of Illinois was the first member to be recognized, and he made the point of order against the provision directing the Secretary of the Navy "to procure armor of the best obtainable quality at an average cost not exceeding \$545 a ton of 2240 pounds, including all royalties." on the ground that it was a change of law to direct the Secretary to procure a certain kind of armor at a certain price. Mr. Boutelle defended the provision, declaring that the House had established by repeated rulings the propriety of such provisions. "If that paragraph," said he, "is obnoxious to the point that it is new legislation, then every word of that bill is obnoxious to the same point. It is simply putting a limitation upon the appropriation of this money which is perfectly legitimate and does not affect in any way the germaneness of the proposition." Representative Lewis of Washington opposed the provision on the ground that the language as used in the bill would permit the Secretary of the Navy to place on the ships the best armor he could buy for \$545 per ton, which would not necessarily be the best obtainable at any price. Chairman Boutelle ridiculed this suggestion, declaring that the language employed did not warrant any such interpretation. Mr. Hopkins in urging his point of order further asserted that the appropriation for armor plate carried by the pending bill was intended, in part, to cover armor for vessels heretofore authorized, and hence the provision certainly "changed existing law." In reply to this contention Mr. Boutelle said:

"The 'Maine,' the 'Missouri' and the 'Ohio,' authorized last year, are as yet unarmored. The armor has not been contracted for for these vessels. There is armor plate in process of manufacture that American shipbuilders are now putting on the Russian men-of-war which are being built in this country. This is acknowledged by all, excepting the Illinois Steel Company and the gentleman from Illinois, to be at least 25 per cent. more powerful in its resisting properties than the Harveyized armor which we have been using heretofore, and which has been regarded, until this improvement was made, as about the best in the world. The Cramps, shipbuilders, to-day are putting on the Russian battle ships this improved armor. The committee is not trying to 'bunco' the House. We are not steering a job through the House. We are not trying to deceive anybody. We are presenting a plain, simple, common sense, matter of fact business proposition. The gentleman from Illinois is simply invoking the technical rules of the House to prevent the committee from exercising its judgment based upon investigation, experience and observation. Now, if this House wants battle ships with inferior armor it has a right to say so. If it wants to clothe the Secretary of the Navy, as we always have hitherto, with power to procure the best defensive armor to protect our men that can be obtained, it can vote upon that and declare it and put in amendments or modifications that the wisdom of this House may suggest. I insist that for any gentleman to get up here and say that he will introduce technical objection after objection to prevent the possibility of my getting this question before this body in such a way that it can consider it is neither statesmanship nor wisdom nor common sense. In my country it is called demagogism, and it is recognized at sight."

When the question came up for a ruling on the point of order the Chair held that as the limitation of price referred solely to the expenditure of the appropriation carried on this particular bill the objection was not sound.

Mr. Hopkins thereupon offered an amendment changing the limit of price to \$445, which was resisted by Mr. Boutelle, who in the discussion that followed gave a brief history of the efforts of the Navy Department to comply with the law passed two years ago limiting the cost of armor to \$300 per ton, emphasizing the failure of the Illinois Steel Company to make good the promises given by Representative Hopkins that they would produce armor at \$300 per ton. Mr. Boutelle warned the House that the armor plate which it was now proposed to purchase—that made by the Krupp process—could not be purchased at the price proposed in Mr. Hopkins' amendment, and predicted that if it should be adopted there would be another indefinite delay in the completion of the new war ships.

Pending action on Mr. Hopkins' amendment Representative Underwood of Alabama offered a substitute for the whole section relating to armor plate and authorizing an appropriation of \$4,000,000 for a Government armor plate factory to be erected on a site to be chosen by a board of three naval officers. This amendment precipitated a general discussion in which several members took part as to the character of the so-called Krupp process, which it was suggested by the advocates of the Government plant the United States might procure either by purchase or by condemnation from the firms owning the process in this country. Representative Cummings of New York declared that the United States could not secure the Krupp process, and Chairman Boutelle, in reply to several inquiries, stated that the purchasers of the process in the United States were understood to have paid a lump sum for the secret with an agreement to pay \$45 or \$50 per ton additional as a royalty. Representative Hilborn of California, a member of the Naval Committee, stated that the Krupp process had never been patented, which brought a rejoinder from Representative Todd of Michigan that the process had been patented not only in Germany but in this country, and he proceeded to exhibit copies of the alleged patents which he said he had secured from the United States Patent Office. In reply Mr. Hilborn said that the trade was undoubtedly familiar with all the Krupp patents taken out in this or any other country, but that it was also well known that these patents did not cover the secret processes necessary to the proper manufacture of so-called Krupp armor. Mr. Todd still strenuously insisted that the process was not in any sense of the word secret. "The whole matter," he said, "is laid bare in these patents now on my desk." Mr. Underwood also insisted that the Krupp process was a simple one which any manufacturer was able to use, and then proceeded to give his idea of it in a manner so vague, however, that his colleagues were unable to differentiate between his description and the popular notion of the Harvey process. "It is a process," said he, "of applying heat according to a well-known plan by pulverized charcoal, bringing the metal to a high temperature, when under certain conditions it is cooled rapidly, leaving a hardened surface which may extend several inches below the face of the plate."

In the subsequent discussion of the Krupp process, Chairman Boutelle stated that the tests made at Indian Head by the Ordnance Bureau fully demonstrated "the great superiority of the plates thus made. Naval experts," he said, had given the assurance that these plates were at least 25 per cent. better and at \$545 per ton were really cheaper than Harveyized plate at \$411, the price now paid. "Krupp armor," said he, "could be put on our war vessels to cover a given superficial area, and having equal power of resistance with Harveyized armor for less money. In other words, the superficial area covered by a ton of Harveyized armor at a cost of \$411 could be protected equally as well by an amount of Krupp armor costing only \$409."

"Now," said he, "I do not want the House to think that I am juggling with figures. I will say to you frankly that we do not intend to make that reduction in the cost for the ships. Why? Because instead of using that amount of armor on these vessels and stopping there, it is proposed, in view of the fact that the armor to cover the same amount of surface weighs so much less, to cover other portions of the ship with armor and to extend the defended surface of the vessels to a considerable degree, bringing the cost of armor for the entire ship up to about the same that we would pay under our contracts to-day. The ships that have this new armor on, and over which they extend the area of armoring to cover places that are undefended now in some of our battle ships, will make them very much more powerful ships and very much more invulnerable ships than those we are building to-day."

The amendment to construct a Government plant was finally ruled out on the point of order, and the question recurring upon the proposition to reduce the limit of price from \$545 to \$445, the House adopted it by a vote of 130 to 58. Chairman Boutelle subsequently moved to recommit the bill with instructions to report it back again with the price of armor at \$545, but this was voted down. The bill was then passed as amended.

The Senate Committee is already at work upon the bill, but the disposition to be made of the House amendments cannot be foreshadowed at this writing.

W. L. C.



# HARDWARE.

## Condition of Trade.

**D**URING the past week the market has been in an excited condition and a number of important advances have been announced, as noted below. There has also been on the part of manufacturers a disposition to withdraw prices, even where higher quotations are not announced. Some of the advances, as, for example, in Nails and Wire, are somewhat startling in their extent, and the new arrangement on Steel goods was consummated so quietly that very few even of the largest trade were aware that negotiations to this end were in progress. A great many goods are held more firmly, as extreme discounts, special terms, &c., are withdrawn by the manufacturers, even in cases where there has been no open intimation to the trade of such hardening in price. Several new lists have been adopted and it is understood that others are under revision. The volume of business continues to be heavy, the large trade stocking up freely, encouraged by the upward tone of the market and the anticipation of a heavy business.

### Chicago.

(By Telegraph.)

The recent advances in all kinds of Hardware have not checked the volume of business, which continues extremely heavy. Jobbers state that they have observed no indications of speculation but believe that dealers are buying to supply their legitimate wants. They are taking small quantities, but are buying frequently. Notable advances have been made during the week. The most important of these was the advance in Wire Nails. Plain Wire and Barb Wire of 25 cents per 100 pounds. Tinware has been marked up 15 to 25 per cent., and retinned goods a minimum of 25 per cent. A large supply house here was in the market for \$100,000 worth of Tinware the past week. Galvanized goods are marked up about 10 per cent. Copper goods have also been advanced another 10 per cent. Manufacturers of Steel goods have advised the trade of an advance of 20 per cent. The scarcity in Wire Cloth is growing worse. Jobbers are now asking \$1.10, but are guarded in making this quotation so that buyers will not take too large quantities. Poultry Netting has been advanced another 5 per cent. The inclement weather of the past week has interfered to some extent with the trade in Roofing Supplies, but this has not affected general business, as the demand in other directions has more than compensated for the slight falling off in this line. The heavy Hardware trade is larger than ever before known. Jobbers, however, are having much trouble in getting delivery from the mills, thus meeting with much inconvenience in supplying their customers.

### St. Louis.

(By Telegraph.)

Prices on Wire goods are going skyward, and an advance of \$5 per net ton has been made on Wire Nails and Barb Wire, with an equal effect on all the light and finer Wires. Makers of Wire Cloth do not seem in position to supply Screen manufacturers with the full quantities which were contracted for, and, although some heretofore builders of Screen Doors have ceased producing, it is not because of lack of consumers. Jobbers are selling Wire Cloth here to-day at \$1.10. Poultry Netting

is firmly held at the newest advance, and sales are on the increase. Discounts on Galvanized Sheets are shrinking, but sales do not fall off. Wood's fine Smooth Iron shows an increase in price, and metal goods all along the line show an upward turn. The 10 per cent. advance on Builders' and Shelf Hardware is being adhered to, and while manufacturers have not yet issued new price-lists the advance generally shows flatly on invoices. Copper Rivets and Burrs are strong and in good demand. Sash Weights have been pushed up \$1 per ton, which in face of the actual increase of raw material must be considered very moderate. Axe manufacturers are said to have withdrawn all former prices, and it is rumored that Refrigerator makers will make revised quotations in view of increased cost of Zinc and Metal Trimmings, which enter largely into Refrigerator construction. Steel goods manufacturers have withdrawn old prices on Rakes, Forks and kindred Tools, with a view to making new quotations in keeping with the greater cost of raw material. A large influx of merchants is expected in St. Louis, owing to the special railroad inducements to be offered shortly. Intending visitors would do well to write their jobbers for particulars.

### Louisville.

**W. B. BELKNAP & Co.**—The past week has shown a gradual recuperation from the period of comparative inactivity forced upon us by the extreme cold and snow of the week before. We were just about getting in shape and hoping for more solid country roads, which, by the way, have been practically impassable now for a month, when another heavy snow storm overtook us and we shall have to wait a thaw and subsequent drying spell before we can hope for much movement of goods for consumption in the rural districts at least.

The enterprising kodakers who go around looking for horrible examples of bad roads might fill their albums now with the greatest ease. The wagons which come to town are solid to the hub with frozen mud, despite the fact that we are better off for turnpikes in Kentucky than most Western and Southern States.

Of course this does not affect the entire country, nor has it dampened the enthusiasm of those buyers, and they are in the majority, who are convinced that there is still money in the market. The whole tendency of staple goods still seems upward. When one compares the lowest price of a few months ago with the present one to-day, he is apt to be astounded. Black Sheets show an advance of \$10 to \$12 per ton; Galvanized a much greater, say in the neighborhood of \$20 a ton, or not far from 40 per cent.

These figures would naturally give us pause, but that pendulum which is so often quoted as swinging up and now down and up the other side, seems headed all one way yet, and while it was to be expected that it would acquire considerable momentum from the start on the other side, that it is past the perpendicular very few people will doubt. We look for a free production, stimulated by the present market prices.

### Cleveland.

**THE W. BINGHAM COMPANY.**—The Hardware business in this market continues active with the advances generally maintained. The volume of orders is large, with seasonable goods for spring consumption predominating. Orders for future delivery show earlier dates of shipment than usual, most of the dealers understanding the necessity of getting goods in hand early in view of the great demand upon manufacturers, which

in many lines is certain to retard delivery in the season for use.

Cleveland mills and factories are crowded with orders, and from all parts of the country come reports of a similar nature. The rise in Pig Iron of over 16 per cent, since January 1, with the enormous increase in price of Copper, Tin and Spelter have caused manufacturers of heavy goods to advance prices with bewildering frequency. There is a general feeling that this class of goods will go higher, and that anything bought at present prices is a good purchase.

This will be the greatest Hardware year that Cleveland has ever known. A larger percentage of the dealers in a constantly widening area are turning to Cleveland for supplies. Its central location, excellent shipping facilities by rail and boat, the large variety of its manufactures of Iron and Steel, and the fact that in no other place in the country are stocks carried with so complete and varied an assortment, give this market advantages which buyers recognize and which secure for its jobbers a constantly growing trade in good times and bad. It is anticipated that the tonnage handled here this year will exceed that of any other Hardware jobbing center in the United States.

#### Baltimore.

CARLIN & FULTON.—The intense cold of two weeks ago has had its blighting effect upon a large section of country, and for the time being has greatly interfered with the marketing of early fruits and vegetables from the far South, and in such sections devoted to their cultivation business for a time is completely prostrated. One customer from Florida writes us as follows:

To the orange industry this last freeze has been, I believe, more disastrous than that of 1895, because further reaching and calculated to destroy the faith in Florida as an orange growing State that in a curtailed condition remained after the last named disaster. The immediate pecuniary loss is not so great as before, for the people having had but few oranges to dispose of since 1895 have learned to make at least a living outside of orange culture. Trade here, so far as I can see, will not be affected seriously. Not much money has been spent for four seasons on groves, and trade was reduced to the handling of the actual necessities of life; things that the people must still have. There can be but little decrease in purchases, while of course there is no prospect for an increased business for years to come.

We quote also from another letter from Florida:

I consider it impossible to estimate the damage. In this vicinity the people depended almost entirely upon the orange. The thermometer registered 12 degrees above, consequently killing the orange trees. Peach trees, guavas and early vegetables were killed also. The State will not recover from the shock for several years, and spring trade is out of the question.

We regret exceedingly to receive such reports, but the recuperative powers of our Southern friends are so great, as shown by their recovery from former disasters, that we hope the injury will not be as permanent as now appears; though undoubtedly for the time being trade will be greatly affected.

In our nearer sections the thaw and rain which have followed the deep snow have converted the roads into quagmires, except where a neighborhood is blessed with macadamized turnpikes, and the advocates of good roads need no better object lesson than the general condition of the country to-day. Our jails and penitentiaries are filled with able bodied criminals supported at the expense of the taxpayers, comfortably clad and housed and well fed, while the roads are left to the spasmodic efforts of county or municipal legislators, utterly forgetful or indifferent as to the increased valuation to any farm or piece of property which results from its accessibility to a well made and well preserved highway.

Every mail brings its share of announcements of new prices, advances in costs, withdrawals of quotations, formations of trusts, combinations or consolidations. An era of speculation seems to have dawned upon the whole country, and where it will end no one knows. The enormous capitalizations of the corporations, whether

financial, manufacturing or mercantile, exceeds anything ever known in the history of this nation. The ability of these trusts to earn the dividends on bonds, preferred stock and common stock, which is offered for investment and for which there seems no end of buyers, is something which no one can safely base an opinion upon; and while circumstances may justify some of the valuations of to-day upon the stocks which are being offered and absorbed, it would seem that there are many which will prove most disappointing after the fever of speculation has disappeared, and the test of future dividends will prove the value of the investment.

#### Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—It is our painful duty to announce the death of William Honeyman of the firm of Honeyman, DeHart & Co. Stricken with paralysis, he lingered but a few weeks, dying in his prime, at the age of 59 years. A man of strong character and individuality, the community feels they have lost one of their most useful citizens. Connected with the Hardware business of this city for 29 years, his place will be hard to fill. Hardware merchants from San Francisco, Seattle, Tacoma and Spokane were in attendance at his funeral. As first vice-president of the Pacific Coast Hardware & Metal Association, he was held in high esteem over the entire Pacific Coast.

There has been little change to chronicle since our last in the local situation from a business standpoint. Trade keeps in the even tenor that we have from week to week advised you of. We have been kept busy advising travelers of changes in costs of goods almost daily. Nails, Wire, Pipe, Copper and Brass Goods still soar toward a higher level. Collections as yet show no improvement, complaint being general in every line of business.

#### Philadelphia.

SUPPLEE HARDWARE COMPANY.—At the time when our last semi-monthly letter to *The Iron Age* was due in New York the writer was snow bound at his residence for three days. It was the greatest blizzard that has been known in this section since 1888, and with that exception ever known. All local trains were interrupted, delayed or did not leave the station; trains between Philadelphia and New York were demoralized and no mail matter reached our city for some days; traffic was suspended, paralyzed, "out of joint." This storm extended along the entire Atlantic Coast, and business was generally interrupted for about one week.

During that time, however, it was quite evident that many manufacturers in the quiet of their offices were refiguring the cost of their product based upon present cost of raw material and expense account with a little profit added, to send adrift new prices. But beyond this the instigators of trusts and combinations were neither sleeping nor dozing, but they were preparing themselves to spring new and amazing surprises upon the trade without a moment's warning or notice. Possibly the greatest surprise was the widespread combination of Steel Goods which had been so quietly worked up by our friend Mr. Parks, and possibly he did a good thing for those manufacturers who have been cutting their Steel in proportionally larger pieces than has been prudent for their exchequer, at least so they they have for many years informed us. Advances in the price of these goods came simultaneously with the information of this combination, and strange as it may seem there were no back or unfilled orders; indeed, we fancy the jobbers themselves have been found napping and many of them have orders booked for future shipments which have not been provided for with manufacturers. It was, however, a relief to see the smiling faces of this manufacturing contingent as against the somber, doleful expressions of the recent past.

There is, however, practically no excuse for the retail merchant not having been secured in his stock, for we think there never has been a time when the wholesale merchants, through their salesmen, have solicited orders



for these goods so early in the season, and those who have been called upon and have not secured their orders have no one but themselves to blame. In this they have not been so prudent as they were in their Green Wire Cloth and Poultry Netting, for on those particular goods every man knew, or should have known, there was no money to any one at the price the goods were sold at, and the demand would be far greater than the production.

Notices of advances upon goods are reaching us daily, which gives every evidence that many goods will be purchased by the average jobber at an early date at a higher price than this former stock was disposed of. We admit that we believe the present conditions of the stock market, trusts and combinations have something to do with these advancing prices, although there is some cause for these advances, caused by the extra cost of raw material. But there never has been in the history of our nation a time when gigantic enterprises have been so successfully floated as has been the case during the past few months. Almost weekly some new and startling announcement is made of an aggregation of capital controlling all the manufacturers engaged in one line of trade. Combinations to advance prices are also successfully carried through. Theorists give all sorts of reasons for these conditions (we were never much believers in theoretical sophistries), and one of these theories is the present tariff laws. We believe they have about as much to do with these large combinations recently floated as the blizzard had to do with them and no more. Indeed, it is a fact that free trade England has been the hotbed of trusts for many years, long before they were even thought of in this country, and they continue to thrive. Indeed while this letter is being dictated word reaches the writer from across the ocean of the formation of a rubber trust of \$50,000,000. It was the great Screw trust, before American Screw manufacturers controlled the market and practically the world, that made fortunes for many persons. Great fortunes have been made in England from trusts and combinations reaching into millions of dollars while we were wading in our swaddling clothes and while we were preparing to reach a "climax of development" which would enable us to supply the demands of our own country. Within the last few years our manufacturers have reached that stage of development, through improved machinery and other modern appliances, coupled with the fact of cheaper raw material, that we can manufacture, and do manufacture, far more than we can within ourselves consume; hence the excessive competition within our own borders has not only reduced the prices but has compelled manufacturers to reach out for other outlets beyond our own shores or close their works. The first is not an easy matter; manufacturers must find and penetrate these markets, all of which requires time, expense and experience. In the meantime excessive competition has resulted in many goods during the past few years being sold at less than the cost of production. Largely owing to this fact promoters of these combinations and trusts have found manufacturers quite accessible for any feasible plan which would insure them a larger amount of profit from their capital invested, although even these promoters were hardly prepared for the general stampede of the masses to make purchases of industrial stocks as fast as floated, believing that there was greater value in these stocks than railroad stocks or other stocks which the excited masses have recently been jumping for.

The Hardware market is quite excited. The great difficulty appears for jobbers to make purchases with a guarantee of goods being delivered in time for their spring sales. With this view of the case it is but natural that the retail trade should show a greater disposition to provide themselves with stock when the season opens. Orders from salesmen come in very freely at the advanced prices. Doubtless the retail merchants feel (as jobbers do) that the end has not yet been reached and goods must continue to advance in price. They doubt-

less have become aware of the fact that the producers of raw material have sold from three to six months ahead. The market has become quite bare of marketable Steel for the use of manufacturers.

Collections are fair.

#### Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Hardly any change can be expected in the condition of the jobbing Hardware trade located on the Missouri River until atmospheric influences take a new departure. For the past month all kinds of weather detrimental to trade have been in decided evidence, and until these conditions change to an entirely different basis outdoor work will have to be postponed. Trade is very much the same as outlined in our last report, and considering the very rough and cold weather might be called remarkably good. Financially and industrially this section of the country is in a very healthy condition.

The conditions that have produced this prosperity are substantial, and as far as business foresight can determine there is nothing to indicate that they will not continue indefinitely, and now that this section has passed the stage of necessity it becomes an inviting field for Eastern capitalists to invest money in manufacturing and industrial enterprises that promise good and ample returns.

#### New Orleans.

A. BALDWIN & Co.—Business has been somewhat quiet during the past two weeks owing to the unprecedented weather in this section of the country. Uncertainty as to the amount of damage has caused the country merchants to wait for further developments before purchasing. However, conditions are changing for the better, and during the past few days there is decided improvement and orders are beginning to come in very freely.

The advances being made are coming so rapidly that most of the dealers are very anxious to cover their wants before further advances take place. The general situation is much more encouraging, and we anticipate a very good spring trade.

### Notes on Prices.

**Wire Nails.**—The great event in the Wire Nail market since our last report was the announcement of an advance of 25 cents a keg, which was made February 27. The increased price of the raw material is one of the reasons for this action. A change has also been made in regard to the price for less than carload lots to small buyers. The difference between the price to this class of trade on carload and less than carload lots is now 10 cents instead of 5 cents, as heretofore. The present prices are as follows, f.o.b. Pittsburgh or Cleveland: To large buyers in carload lots, \$1.85; to large buyers in less than carload lots, \$1.87½; to small buyers in carload lots, \$1.90; to small buyers in less than carload lots, \$2. There has been an active business during the week and the mills are fully occupied. It remains to be seen whether this last advance will have the effect of curtailing purchases. The American Steel & Wire Company have concentrated their selling departments in Chicago and New York, and quotations on products made by this concern are no longer sent out from the Pittsburgh offices as formerly. All quotations on Nails, Wire and Rods for delivery in the Pittsburgh district will be furnished by the general offices.

**New York.**—There has been a fair movement of Nails during the week. The announcement of the advance in prices was a genuine surprise to the local trade. In view of the advance present quotations are as follows: Carload lots on dock, \$2.05; small lots from store, \$2.20 to \$2.25. Manufacturers are refusing to accept orders for future delivery, quotations being only fair for immediate acceptance.

**Chicago, by Telegraph.**—Manufacturers report a very good business during the entire week. The advance in Steel Billets, together with their scarcity, is given as the

reason for advancing the price on Monday of carload lots to \$2, Joliet or DeKalb. The advance above the carload price on small lots has been fixed at 10 cents. Jobbers report a continued demand from their customers notwithstanding the advance, and quote small lots from stock at \$2.10.

*St. Louis, by Telegraph.*—Trade has been on the lookout for higher prices and has not been disappointed. The advance has caused another shock to the holdovers who would not come into line. Makers quote \$2, base, f.o.b. St. Louis, in carloads to jobbers. Single cars may be had of jobbers at \$2.05, while smaller quantities bring \$2.10 to \$2.15.

**Cut Nails.**—In sympathy with Wire Nails the Cut Nail market is firmer and higher. An advance of 5 cents has been made, making the market price now \$1.40 on carload lots, f.o.b. Pittsburgh. The high price ruling for Wire Nails is reported to be having its effect in encouraging the sale of the Cut. It is reported that negotiations are under way looking to a united agreement or combination of Eastern mills, but nothing definite has been matured.

*New York.*—New York prices for Cut Nails are as follows: Carload lots on dock, \$1.55; small lots from store, \$1.65.

*Chicago, by Telegraph.*—Manufacturers have advanced the price of carload lots of Cut Nails to \$1.50, Chicago. Jobbers up to this time have continued to quote small lots from stock at the same price.

*St. Louis, by Telegraph.*—Cut Nails are responding to the onward movement of all metal products. To day's quotations from store are placed at \$1.60, with no tendency to drop.

*Pittsburgh.*—We are advised that the demand for Cut Nails is fairly good and the tone of the market is strong. It is not improbable that the Cut Nail factory of the Jefferson Iron Works at Steubenville, Ohio, containing 128 Cut Nail machines, which has been idle for a long time, will soon be started up. It was sold at sheriff's sale on Monday, February 27. We quote Cut Nails at \$1.35, base, f.o.b. Pittsburgh, to which freight to destination should be added.

**Barb Wire.**—An advance of \$5 a ton was made on the 27th ult. on Barb Wire, and present quotations are as follows, f.o.b. Pittsburgh or Cleveland: To large buyers in carload lots, Painted, \$1.95; Galvanized, \$2.35; to small buyers in carload lots, Painted, \$2; Galvanized, \$2.40; to small buyers in less than carload lots, Painted, \$2.10; Galvanized, \$2.50. The market is characterized by a very firm tone, and the manufacturers are refusing to take orders for delivery after March and are making quotations only for immediate acceptance.

*New York.*—The demand for Barb Wire during the week has been fair but not especially heavy. In accordance with the advance made by the manufacturers local prices are materially advanced and are represented by the following quotations: Carload lots of Four-Point Galvanized on dock, \$2.50; small lots from store, \$2.60. Painted Wire is 40 cents less.

*Chicago, by Telegraph.*—The demand for all kinds of Wire continues active, both with manufacturers and jobbers. The rise in prices seems to have had no effect in checking business. The higher cost of Steel caused manufacturers to make an advance on Monday of 25 cents per 100 pounds in the whole line of Wire. They now quote carload lots of Painted Barb Wire at \$2.10, Joliet or DeKalb, and Galvanized \$2.50, with 10 cents additional per 100 pounds for small lots. Carload lots of Plain Annealed Wire are quoted \$1.85, base, with the same advances on Galvanized and on small sizes as above. Plain Wire in even weight bundles, 50 pounds or over, is charged 5 cents extra. Jobbers report a continued steady demand for all kinds of Wire, and have marked up their prices to the same as those quoted by manufacturers for less than carloads.

*St. Louis, by Telegraph.*—In line with Wire Nails an increase of \$5 per ton is noted in Barb Wire, and the demand for it keeps up. The sale for it will unquestionably cease with softer weather, and now that lagging mer-

chants see the price larger than ever new buyers will come into the market. Mills quote carloads to jobbers at \$2.10, f.o.b. St. Louis, for Painted and Galvanized at \$2.50. Jobbers ask an advance of 5 cents per 100 for single cars, with greater advances for smaller lots.

**Smooth Wire.**—The market for Smooth Wire has been advanced 25 cents, and is now represented by the quotation of \$1.70, base, with 40 cents advance for Galvanized, f.o.b. Pittsburgh or Cleveland. To single carload buyers the price is \$1.75, base, f.o.b. Pittsburgh or Cleveland, and for less than carloads, \$1.85. An advance of 40 cents is made for Galvanized.

**Steel Goods.**—The trade will be surprised to learn that a strong combination has been effected on Steel Goods as a result of the efforts of John H. Parks. The details of the arrangement are not as yet made public, but it is understood to be similar to that which prevails in Wood Goods. A striking feature of the plan is the abandonment of the complicated list which has been in force, dividing the goods into a variety of groups, and going back to the lower and more simple list which was in force in 1895. This we are confident will be appreciated by the trade, simplifying as it does the keeping track of prices in this line. A plan of discounts to three classes of trade has been determined upon, involving, it is roughly estimated, an advance of 10 to 15 per cent. in the price of the goods. The general line of Steel Goods may be quoted to good retail trade at a discount of 60 and 10 and 2 per cent. from the 1895 list, terms 90 days, or 3 per cent. discount for cash in 10 days. Coal and Coke Forks, &c., are subject to a discount of 50 per cent., and Malleable Rakes to a discount of from 70 and 10 per cent. to 75 per cent.

**Wrought Iron Pipe.**—The manufacturers of Wrought Iron Pipe have adopted a revised price-list of Standard Extra and Double Extra Strong Wrought Iron Pipe and Well Casing, which is given below. In order to simplify the discounts the list has been compiled with the idea of using one base discount for Standard Black or Galvanized Extra Strong and Double Extra Strong Pipe, instead of different discounts as heretofore. The trade will doubtless appreciate this action, which very much simplifies the quotation of this line of goods. The new list on Wrought Iron Pipe is as follows, subject to a discount of 60 per cent., with six 10's extra, f.o.b. mill:

#### Standard Steam, Gas and Water Pipe.

##### BLACK AND GALVANIZED.

Nominal size inside diameter, inches.	Price per foot, Black.	Price per foot, Galvanized.	Thickness, inches.	Nominal weight per foot, pounds.	No. of threads per inch of screw.
1/8	\$0.08 1/2	\$0.18	0.068	0.24	27
1/4	.08 1/2	.16	0.088	0.42	18
3/8	.08 1/2	.16	0.091	0.56	18
1/2	.10 1/2	.17	0.109	0.84	14
3/4	.11 1/2	.19	0.113	1.12	14
1	.16 1/2	.26	0.134	1.67	11 1/2
1 1/4	.22	.36	0.140	2.24	11 1/2
1 1/2	.27	.44	0.145	2.68	11 1/2
2	.36	.59	0.154	3.61	11 1/2
2 1/2	.47	.91	0.204	5.74	8
3	.57	1.20	0.217	7.54	8
3 1/2	.68	1.60	0.226	9.00	8
4	1.07	1.75	0.237	10.66	8
4 1/2	1.40	2.30	0.246	12.49	8
5	1.55	2.55	0.259	14.50	8
6	1.95	3.50	0.290	18.76	8
7	2.53	4.30	0.301	23.27	8
8	2.95	5.20	0.322	28.18	8
9	3.60	....	0.344	33.79	8
10	4.50	....	0.366	40.00	8
11	5.30	....	0.375	45.00	8
12	5.75	....	0.375	49.00	8
13	6.50	....	0.375	54.00	8
14	7.25	....	0.375	58.00	8
15	7.50	....	0.375	62.00	..

#### X and XX Strong Steam, Gas and Water Pipe.

##### X STRONG PIPE.

Size, inches.	Actual Outside Diameter.	Nominal Inside Diameter.	Thickness.	Nominal Weight per foot.	Price per foot.
1/8	0.405	0.205	0.100	0.29	\$0.22
1/4	0.540	0.294	0.123	0.54	.17
3/8	0.675	0.424	0.127	0.74	.17
1/2	0.840	0.542	0.149	1.09	.19
3/4	1.05	0.736	0.157	1.39	.20
1	1.315	0.951	0.182	2.17	.29
1 1/4	1.66	1.272	0.194	3.00	.39
1 1/2	1.900	1.494	0.203	3.62	.48
2	2.375	1.933	0.221	5.02	.63
2 1/2	2.875	2.315	0.280	7.67	1.15
3	3.500	2.892	0.304	10.25	1.50
3 1/2	4.000	3.358	0.321	12.47	1.90
4	4.500	3.818	0.341	14.97	2.15
4 1/2	5.000	4.280	0.360	18.22	2.80
5	5.563	4.813	0.375	20.54	3.10
6	6.625	5.750	0.437	28.58	3.90
7	7.625	6.625	0.500	37.67	5.25
8	8.625	7.625	0.500	48.90	6.00



## XX STRONG PIPE.

1/4	0.84	0.244	0.298	1.70	.50
3/4	1.05	0.422	0.314	2.44	.60
1	1.315	0.587	0.364	3.45	.75
1 1/4	1.66	0.885	0.388	5.20	.85
1 1/2	1.90	1.088	0.406	6.40	1.10
2	2.375	1.491	0.442	9.62	1.60
2 1/4	2.875	1.755	0.500	13.68	2.30
3	3.50	2.284	0.608	18.56	3.25
3 1/4	4.00	2.715	0.642	22.75	4.20
4	4.50	3.136	0.682	27.48	4.85
4 1/4	5.00	3.564	0.718	32.53	6.45
5	5.563	4.063	0.75	38.12	7.35
6	6.625	4.875	0.875	53.11	9.45
7	7.625	5.875	0.875	62.38	11.85
8	8.625	6.875	0.875	71.62	13.75

## Lap Welded Casing.

Nominal inside diameter. Inches.	Actual outside diameter. Inches.	Price per foot.	Nominal weight per foot. Pounds.	No of threads per inch of screw.
2	2 1/4	\$1.28	2.22	14
2 1/4	2 3/4	.50	2.82	14
2 3/4	3	.32	3.15	14
3	3 1/4	.24	3.45	14
3 1/4	3 3/4	.37	4.10	14
3 3/4	4	.40	4.45	14
4	4 1/4	.43	4.78	14
4 1/4	4 3/4	.49	5.56	14
4 3/4	5	.54	6.00	14
5	5 1/4	.56	6.36	14
5 1/4	5 3/4	.58	6.73	14
5 3/4	6	.63	7.80	14
6	6 1/4	.65	8.20	14
6 1/4	6 3/4	.67	8.62	14
6 3/4	7	.76	10.46	14
7	7 1/4	.91	11.58	14
7 1/4	7 3/4	1.00	12.34	14
7 3/4	8	1.07	13.55	14
8	8 1/4	1.30	15.41	11 1/2
8 1/4	8 3/4	1.43	16.07	11 1/2
8 3/4	9	1.60	17.60	11 1/2
9	9 1/4	1.90	21.90	11 1/2
9 1/4	9 3/4	2.30	26.72	11 1/2
9 3/4	10	2.55	30.35	11 1/2
10	10 1/4	2.95	35.78	11 1/2
10 1/4	10 3/4	3.45	42.02	11 1/2
10 3/4	11	4.15	47.66	11 1/2
11	11 1/4	4.50	51.47	11 1/2

Screw and Socket Casing is quoted at discount 57 1/2 and 10 per cent., and Inserted Joint at discount 57 1/2 per cent., f.o.b. mill.

The following rules, &c., are sent out in connection with the new list and as relating to deliveries, &c., will be of interest:

## Rules Covering Deliveries of Tubular Goods

No. 1. All less than carload lots must be sold delivered f.o.b. cars at seller's mill, or at Boston, New York, Philadelphia, Reading, Pa., Middletown, Pa., Pittsburgh, Wheeling, Youngstown, Ohio, McKeesport, Pa., Warren, Ohio, Oil City, Pa., Chicago and St. Louis.

No. 2. Deliveries in carloads may be made (the seller agreeing), free of cost to the purchaser, at any railroad station or boat dock within the territory east of the Mississippi River, from its junction with the Ohio River at Quincy, Ill., and the C. & Q. R.R. Company's tracks, thence to Chicago, Ill., and the southern and eastern shores of Lake Michigan, and north of the Ohio River, both banks, and the northern State line of Kentucky and Virginia, and to Milwaukee, Wis., and Richmond, Va., provided the tariff rate from mill to Eastern points is not greater than the tariff rate from mill to Boston, and to Western points not greater than from mill to East St. Louis, Ill.

No. 3. On shipments of carloads destined to points outside of this district the freight may be paid to forwarding lines at any of the following gateways selected by customer:

Alexandria, Va.	Baltimore, Md.	East Hannibal, Mo.
Huntington, W. Va.	Cincinnati, Ohio.	Beardstown, Ill.
Kenova, W. Va.	Louisville, Ky.	Peoria, Ill.
Richmond, Va.	Jeffersonville, Ind.	Chicago, Ill.
Portsmouth, Va.	East St. Louis, Ill.	Milwaukee, Wis.
Hagerstown, Md.		

No. 4. On shipments via rail and water freight may be paid to any of the following gateways, via which customer orders his goods:

Chicago, Ill.	West Superior, Wis.	Boston, Mass.
Milwaukee, Wis.	St. Paul, Minn.	Philadelphia, Pa.
Manitowac, Wis.	Minneapolis, Minn.	Baltimore, Md.
Duluth, Minn.	New York, N. Y.	Newport News, Va.
Norfolk, Va., and to ports in the Upper Peninsula of Michigan.		

No. 5. Goods shall not be sold f.o.b. mill with a freight allowance.

No. 6. No allowance toward freight shall be made in excess of actual cost of delivery in accordance with above rules.

## Pipe Trade Customs.

Every piece of Pipe, Tubing, Casing, Line Pipe and Drive Pipe is carefully tested, but it is impossible to always detect imperfections; the only guarantee that is given is to replace such goods as prove defective. Under no circumstances is the seller responsible for any damages beyond the price of the goods. No charges for labor or expenses required to repair defective goods or occasioned by them will be allowed. If the goods are

defective the measure of damages is the price of the defective pieces.

Claims for shortages or deductions for erroneous charges must be promptly presented.

The outside diameter of goods heavier than "stand ard" is the same as standard, the extra thickness being on the inside, so that the different weights of the same size use the same coupling.

**Rules.**—The market for Boxwood Rules has for a long time been in a demoralized condition, very low prices prevailing, the trade being accustomed to a base discount of 80 per cent., with a series of extra 10's. In view of the improved condition in the market at large and the active demand, and especially on account of the increased cost of Brass, the manufacturers have been withdrawing some of their extra discounts, so that the price is firmer and a little higher than it has been.

Under date March 1 Stanley Rule & Level Company, New Britain, Conn., issue a revised discount sheet to replace the one sent out by them January 2. The only change in this discount sheet is in the quotations on Boxwood Rules, which are quoted at discount 75 and 10 per cent., instead of discount 80 and 10 per cent., as heretofore. This will doubtless have the effect of giving materially increased strength to the market on this line and it is anticipated that other manufacturers will also make 75 per cent. the first discount. No change is made in the price of Ivory Rules.

**Picks and Mattocks.**—A revised list was adopted by the manufacturers of Picks and Mattocks at a meeting held in Pittsburgh February 23. The new list is given below and is subject to a discount of from 70 and 10 to 75 per cent.:

Mattocks.		Per dozen.
Adze Eye, Long Cutter,	6 pounds.....	\$17.00
" " Short " "	5 1/2 " " " " " "	16.50
" " Long " "	5 " " " " " "	16.00
" " Short " "	5 " " " " " "	16.00
" " Pick Mattocks,	6 " " " " " "	17.00
" " " "	5 " " " " " "	16.00

Grub Hoes.		
Western Pattern, No. 0, 3 pounds.....		\$11.50
" " " " 1, 3 1/2 " "		12.00
" " " " 2, 4 " "		12.50
" " " " 3, 4 1/2 " "		13.00
Baltimore " " 1, 3 1/2 " "		12.00
" " " " 2, 4 1/2 " "		13.00
" " " " 3, 5 " "		14.00
" " " " 4, 5 1/2 " "		15.00

Railroad Picks.		
Adze Eye, 4 to 5 pounds.....		\$11.50
" " 5 to 6 " "		12.50
" " 6 to 7 " "		13.50
" " 7 to 8 " "		14.50
" " 8 to 9 " "		16.50
" " 9 to 10 " "		18.50
Straight Weights.....	4 lb. 5 lb. 6 lb. 7 lb. 8 lb. 9 lb. 10 lb.	
	\$11.50 12.00 13.00 14.00 15.50 17.50 19.50	

Ore Picks.		
Same List Price as Railroad Picks.		
Tamping Picks.		
Adze Eye, 6 to 7 pounds.....		\$18.00
" " 7 to 8 " "		19.00
" " 8 to 9 " "		20.00
Straight Weights.....	6 lb. 7 lb. 8 lb. 9 lb.	
	\$18.00 18.50 19.50 21.00	

Hazel Hoes.		Per dozen.
Hazel Hoes.....		\$14.00
Accomac Hoes.		
	6 inch. 6 1/2 inch. 7 inch.	
Heavy, per dozen.....	\$18.00 19.00 20.00	
Light, " " " "	14.50 15.00 16.00	

**Pumps.**—A majority of the leading Pump concerns met in Chicago recently to readjust the prices of Pumps, made especially necessary by the marked advance in some of the principal materials from which they are produced. There were representatives from 22 houses and prices were thoroughly revised, the meeting being referred to as one of the most successful ever had. The advances, ranging from 10 to 30 per cent., are largely in staple and competitive Pumps, which many manufacturers assert have long been sold without profit.

**Cordage.**—The continued hostilities in the Philippine Islands have caused an advance in Manila Hemp to 8 cents per pound. As a result Manila Rope is quoted higher and

Sisal has moved up in sympathy. The market is firm on the basis of  $8\frac{1}{4}$  cents for Manila Rope, 7-16 inch and larger, and  $7\frac{1}{4}$  cents for Sisal of corresponding size. Some manufacturers are not anxious to book orders at these prices, while others are filling orders accepted at these quotations, but are quoting  $\frac{1}{4}$  cent higher for new business. The general impression among manufacturers is that Hemp will be still higher. Jobbers who have stocks to draw from, purchased at lower figures, are making slight concessions to favored customers from the following manufacturers' prices:

	Per pound, cents.
Manila, 7-16 inch and larger	$8\frac{1}{4}$
" $\frac{3}{8}$ inch	$8\frac{1}{2}$
" $\frac{1}{2}$ and 5-16 inch	$9\frac{1}{4}$
Sisal, 7-16 inch and larger	$7\frac{1}{4}$
" $\frac{3}{8}$ inch	$7\frac{3}{4}$
" $\frac{1}{2}$ and 5-16 inch	$8\frac{1}{4}$
" Lath Yarn	$6\frac{3}{4}$

Manila Tarred Rope, 15 thread, is quoted  $8\frac{1}{4}$  cents, as is also Manila Hay Rope, medium. The price of Jute Rope is  $5\frac{1}{2}$  to 6 cents.

**Binder Twine.**—The advance in the price of Hemp has also resulted in higher quotations on Binder Twine. Business in this line has been fairly active during the month, as a result of a firmer feeling among manufacturers, who anticipated an advance in the raw material. The following are manufacturers' prices for carload lots, f.o.b. Eastern factories:

	Cents.
White Sisal, 500 feet to pound	$8\frac{1}{2}$ to $8\frac{3}{4}$
Standard, 500 feet to pound	$8\frac{1}{2}$ to $8\frac{3}{4}$
Manila, 600 feet to pound	$9\frac{1}{4}$ to $9\frac{3}{4}$
Pure Manila, 650 feet to pound	$9\frac{3}{4}$ to 10

**Glaziers' Points.**—On account of the increased cost of the raw material Glaziers' Points are commanding higher prices, and the market is represented by the following quotations:

	Cents.
Bulk and 1-pound papers	11 $\frac{1}{2}$
$\frac{1}{2}$ -pound papers	12
$\frac{1}{4}$	12 $\frac{1}{2}$

**Augers and Bits.**—The manufacturers of Augers and Bits are quite generally withdrawing their quotations or announcing higher prices. There have, in fact, been two or three upward movements since the opening of the year, and this whole line is perceptibly higher. A good many of the retail trade are, however, finding discount 80 per cent. or a little better obtainable, but with the present tendency of the market it is questionable how long this will be the case.

**American Screw Company.**—American Screw Company, Providence, R. I., under date February 23 have issued a revised discount sheet announcing advances in Brass and Bronze Wood Screws adopted 21st ult., Brass Machine Screws adopted 22d ult. and Tire and Stove Bolts adopted 23d ult. Reference to these different advances will be found in our last or in this issue.

**Withdrawals of Prices.**—In the present condition of the market, with the upward tendency in many lines, a good many manufacturers are announcing the withdrawal of their prices as a precursor doubtless in many cases to the announcement of advanced prices. In this connection the following advices will be of interest to the trade:

**THE SNELL MFG. COMPANY,** Fiskdale, Mass., John H. Graham & Co., 113 Chambers street, New York, selling agents, have withdrawn all prices on Auger Bits.

**DILLE & MCGUIRE MFG. COMPANY,** Richmond, Ind., owing to the general advance in the cost of material going into their Lawn Mowers as well as the advanced cost of lumber and labor, state that they find it necessary to advance the price of their Mowers 10 per cent. This is to take effect at once, all unaccepted quotations being made void.

**LANE BROS. COMPANY,** Poughkeepsie, N. Y., advise us that in consequence of the pronounced advance in the price of all materials entering into their manufactures they are obliged to advance prices, taking effect March 1.

**THE CHISHOLM & MOORE MFG. COMPANY,** Cleveland, Ohio, state that owing to the increased cost of labor and material they are obliged to withdraw quotations upon the Moore Anti-Friction Differential Chain Hoist and to lightly advance the price. They also state that the price

of their Door Hangers and Track will hereafter be 10 per cent. higher to cover increased cost of labor and material.

**THE NEW HAVEN COPPER COMPANY,** John H. Graham & Co., 113 Chambers street, New York, selling agents, have withdrawn prices on Auger Bits.

**WITHINGTON & COOLEY MFG. COMPANY,** Jackson, Mich., announce that the advance in materials and general market conditions are such that they withdraw all quotations on Steel Goods. Similar action has doubtless been taken by other manufacturers.

**Steelyards.**—Peck, Stow & Wilcox Company, Cleveland and New York, announce that the price of Steelyards, both American and Domestic, and Farmer's and Hart's represented on page 209 of their 1899 catalogue will be 40 and 10 per cent. discount, and that they have discontinued the manufacture of the 50-pound Iron Bar American and Domestic Steelyards. The list on their 50-pound Steel Bar American and Domestic Steelyards will be \$6 per dozen, terms f.o.b. Cleveland, with no allowance for freight.

**Cast Iron Butts.**—An advance of about 10 per cent. has been made by the manufacturers of Cast Iron Butts, and the market is now represented by the general price of discount 75 and 10 per cent.

**Machine Screws.**—An advance in Brass Machine Screws has been made by the manufacturers, the Iron remaining as before. This is on account of the increased cost of the raw material. The regularly announced discounts on these goods are as follows:

	Per cent.
Iron, flat and round head	.60
" fillister head	.50
Brass, flat and round head	.50
" fillister head	.40

**Poultry Netting.**—The market for Poultry Netting is very firm, and a good deal of scarcity is being developed. Merchants whose orders were placed in good season complain of delay in their execution. In view of the condition of the Wire market, in connection with the large demand, prices are perceptibly higher, and in a general way represented by discount of 85 per cent. for factory shipments, but lower prices are very frequently made by the jobbing trade, whose purchases before the advance put them in a position to undersell the manufacturers. Many anticipate that a higher price will soon prevail, and that those who have a stock on hand can make a handsome profit.

**Market Wire.**—The manufacturers of Market and Stone Wire are in many cases refusing to quote, and in view of the heavy demand upon their products are not in a position to supply the goods at all promptly. In this condition of things there is a good deal of uncertainty in regard to the market prices on this line.

**Poultry Netting Staples.**—The manufacturers of Poultry Netting Staples have adopted a list price of 33 cents for  $\frac{3}{4}$ ,  $\frac{1}{2}$  and 1 inch Staples, galvanized, which is subject to a discount to the general trade of about 85 and 10 per cent. This is instead of selling the goods at a base price as heretofore, and it will be observed that a very considerable advance in price is thus made. The trade quite generally had purchased their supply for the season at considerably lower figures. In common with all Wire products these goods have a very firm tone with an upward tendency.

**Heavy Hammers.**—The market for Heavy Hammers has for a long time been an open one with active competition between the manufacturers, with the natural result of developing low and unprofitable quotations. There have, however, recently been conferences between the manufacturers and an agreement has been reached by which advanced prices have been determined upon. The market on these goods is in a general way represented by the quotation of about 80 and 10 per cent., lower prices being made to close buyers.

**Coil Chain.**—In view of the increased cost of the raw material Chain is decidedly firm in tone, but the advances made thus far are unimportant. Some manufacturers have, however, been recently withdrawing quotations and the tendency is toward somewhat higher prices.



**Wrought Washers.**—A similar condition of things prevails in Wrought Washers, and some of the extreme prices have been withdrawn and higher prices substituted.

**Steel Hollow Ware.**—An advance of about 10 per cent. has been made by leading manufacturers of Steel Hollow Ware, and on Spiders and Griddles the market is represented by the quotation of the discount 75 and 10 per cent. In Kettles and Deep Ware the ruling price is about 65 per cent.

**Bright Wire Goods.**—There has been no further general advance in the price of Bright Wire Goods, but this line is held firmly in view of the strength of the Wire market, the Brass goods especially being very firm on account of the cost of the raw material. When the Brass goods are purchased separately from the Iron a higher price is demanded, but in ordinary mixed orders both the Brass and Iron are often purchased at the same discount.

**Maslin Kettles, &c.**—An advance has been made by the manufacturers of Cast Iron Enameled Ware, and the following quotations may be given as representing the market:

	Discount. Per cent.
Maslin Kettles.....	80
Boilers and Saucepans.....	60 to 60 and 5
Glue Pots, tinned.....	45
"    enameled.....	50

**Wire Cloth.**—There is a great scarcity of Screen Wire Cloth, and those who have goods to supply to the trade are in many cases asking materially higher prices, in some instances demanding as much as \$1.25. A considerably lower price is, however, representative of the market at present.

**Glass.**—The American Glass Company have extended the rebates in force and covering orders placed during a portion of January and February, through the months of March and April. These rebates apply to the purchases of the largest buyers, and are 25 per cent. discount on Double Strength and 15 per cent. on Single Strength Glass. The quantity allowed each concern was arbitrarily restricted by the combine and in many cases did not cover the amount the purchasers desired. The amount obtainable for the months of March and April has been reduced to one-quarter of that allowed each concern in January. The idea seems to be to reduce the price to a point at which outside factories cannot sell Glass at a profit, at the same time keeping their stock low while combine stocks are accumulating, and reserving the latter for higher prices during the summer and early fall months. The ultimate design apparently is to force outside factories into the combination. For less than carload lots of Glass local dealers are asking 85 and 5 per cent. discount. On carloads 85 and 15 per cent. discount is quoted, and in some cases lower figures are obtainable. There is practically no carload business and little demand for small lots. American Glass Company's prices to the regular trade are as follows:

Districts.	A.	B.	C.	D.	E.
500 boxes or more.....	85 & 10	85 & 10	.....	.....	85 & 10
Carloads.....	85	85	85 & 5 & 2½	.....	85
3000 boxes or more.....	85 & 5	85 & 5	.....	.....	85 & 5 & 2½
1000 boxes or more.....	.....	.....	85 & 10 & ¾	.....	.....

These prices are subject to freight allowance.

**Oils.**—**Linseed Oil.**—The distribution of Linseed Oil is of fair volume, with prices steady for City Raw at 41 cents per gallon in lots of five barrels and larger, and 42 cents in lots of less than five barrels. For Boiled Oil 2 cents per gallon advance is obtained. Out of town brands are quoted at 1 cent less than these prices. Irregularities are reported in price at some Western points, where competition is more pronounced.

**Spirits Turpentine.**—During the week under review Turpentine fell off ½ cent, but later regained its former value and is now firm at 46½ cents for Southern and 47 cents for machine made barrels. Varnish makers are buying as opportunity offers and are expected by holders to become heavy purchasers in the future. Reports from the South indicate light stocks and improved export demand.

**Paints and Colors.**—**White Lead, &c**—Manufacturers have announced an advance in Lead products of ¼ cent per pound, including White Lead, Red Lead and Litharge, taking effect February 23. Higher prices have been expected by the trade and many large buyers have placed contracts in anticipation of an advance. The following are the prices and terms now in force: White Lead, Dry or in Oil, Red Lead and Litharge in kegs:

In lots of less than 500 pounds.....	6½ cents net.
"    500 pounds and over.....	5½ cents.
Dry White lead in barrels.....	½c. per pound less than price in kegs.
Red Lead and Litharge in barrels and half barrels.....	¼c. "    " less than price in kegs.
White Lead in 12½-pound tin pails (packed in 100-pound cases).....	1 c. "    " over price in kegs.
White Lead in 25 pound tin pails (packed in 100 or 200 pound cases).....	½c. "    " over price in kegs.
White Lead assorted in 1, 2, 3 and 5 pound cans (packed in 100 pound cases).....	1½c. "    " over price in kegs.

**TERMS:** On lots of 500 pounds and over, 60 days or 2 per cent. discount for cash if paid in 15 days from date of invoice; f.o.b. at New York.

## The Effect of Combinations.

### A Merchant's Argument Against Cutting Prices.

ONE of the most vital and interesting questions now occupying the attention of the trade—both large and small—is the attitude of the various aggregations in the manufacturing line.

In some instances these combinations absolutely control the whole field, for the present, though nothing is more certain than that sooner or later they will be subjected to very severe competition. Fortunately, the parties in control seem to realize the wisdom of moderation, and to feel that though it is excellent to have a giant's strength, it is both tyrannical and unwise to use it like a giant.

In other words, the experienced heads in these combinations are evidently building for the future, so it has come about that they have publicly announced their policy of endeavoring to place every purchaser on a fair and equitable basis, so that every buyer can purchase according to either his capacity or his power of distribution, and thus he will be on exactly the same footing as his neighbor in the same class.

This simple but direct policy will solve a whole host of annoying questions that have plagued the Hardware trade, and certainly should produce an even market and thus enable every dealer to realize a better profit than he has hitherto been enjoying.

In view of these facts it is the extremity of folly on the part of any wholesaler or retailer to cut prices, especially when there is every reason to believe that during the next few months it is simply going to be a question of supplying the demands rather than to have to search after them by way of inducements in prices. Nothing can be more foolish; nothing more short sighted than any undue cutting of prices in the present situation.

## New England Hardware Dealers' Association.

The usual monthly meeting of the New England Hardware Dealers' Association will be held at the United States Hotel, Boston, on the evening of the 8th inst. As J. Carleton Nichols, who was elected president at the last meeting, has declined to serve, a new election has been ordered for that evening. Investigating and pricing committees will also be chosen. The subjects announced for discussion are the following:

Is it advisable to continue as a social organization? If not, what can you suggest to make it a business organization?

Would it be advisable to have an associate membership of out of town dealers at a minimum cost?

The Entertainment Committee in charge of the meeting are John M. Fiske, Natick; Arthur C. Lamson, Marlboro, and Calvin M. Nichols, Dorchester.

### Kansas Retail Hardware Dealers' Association.

A retail Hardware association has just been organized in Kansas. At a meeting held at Topeka on the 13th ult. formal action was taken and the following officers elected for the first year:

Frank Rudy, Paola, president.  
S. J. Gilbert, Arkansas City, vice-president.  
J. A. Cole, Topeka, secretary-treasurer.

#### EXECUTIVE COMMITTEE:

A. Buckley, Parsons.  
C. W. Singleton, Greeley.  
Solomon Landis, Hoyt.  
J. F. Berger, Anthony.  
H. C. Culver, Topeka.

### New England Iron and Hardware Association.

It is announced that the annual dinner of the New England Iron and Hardware Association will be given at Young's Hotel, Boston, Tuesday, March 21, at 6 p. m. The committee expect to have an attractive list of speakers and every effort will be made to surpass the previous successful dinners of this association.

### American Screw Company.

#### Change of Management.

AT the annual meeting of this corporation on February 14, 1899, a stock vote was taken, resulting in the retirement of the management that has controlled the corporation for the past 30 years. At a subsequent meeting of the new Board of Directors the following officers were appointed: President, Clark Thurston; agent, James A. Nealey; treasurer and secretary, George W. Thurston; general superintendent, Benjamin Thurston.

### Trade Items.

F. J. MATTISON, 127 Duane street, New York, is now the exclusive selling agent for the line of Hardware Specialties and Mechanics' Tools made by L. A. Sayre & Co., 332-340 Mulberry street, Newark, N. J., in the territory known as Greater New York. A catalogue of 83 pages containing a large assortment of small Tools for various trades will be sent on application.

DON McMILLAN, who last year represented E. C. Stearns & Co. of Syracuse, N. Y., is now travelling for a number of concerns, among whom are Wood Mfg. Company, S. Cheney & Son, E. U. Scoville, Syracuse Twist Drill Company, Frontenac Mfg. Company, Syracuse Stove Company, Economy Foundry & Machine Company, Economy Mfg. Company, Phoenix Mfg. Company and Rives & Co. Mr. McMillan is also representing a line of Oil Stones made in Manlius, N. Y.

A. MUGFORD, the well-known engraver and electro-typer, Hartford, Conn., with New York office at 120 Liberty street, New York, is sending out a very handsome pamphlet, entitled "Glimpses of Our Plant," which gives interesting views of the various departments. It also illustrates the character of his work, which embraces Designing, Wood Engraving, Half-Tones, Line Work, Electrotyping and Catalogue publishing.

### Price-Lists, Circulars, &c.

SARGENT & CO., New Haven, Conn., and New York Door and Window Screen Hardware.

CLARK MFG. COMPANY, Buffalo, N. Y.: 1899 catalogue genuine Clark's Blind and other Hinges, Sash Pulleys, &c.

BLISH, MIZE & SILLIMAN HARDWARE COMPANY, Atchison, Kan.: Spring catalogue seasonable Hardware.

JOHN S. LENG'S SON & CO., 4 Fletcher street, New York: 1899 catalogue of Bicycle Materials, Sundries, Tools, &c.

JOSEPH G. POLLARD, 141 Raymond street, Brooklyn, N. Y.: Contractors' Tools and Supplies.

HAMBLIN & RUSSELL MFG. COMPANY, Worcester, Mass.: Hardware Specialties and Wire Goods.

A. C. WILLIAMS, Ravenna, Ohio, Surplus, Dunn & Co., export sales agents, 55 Warren street, New York: 1899 catalogue of Hardware, House Furnishing Specialties, Toys, &c. The extensive line of goods manufactured is attractively presented.

CHISHOLM & MOORE MFG. COMPANY, Cleveland, Ohio: Catalogue of Chain Hoists, Electric and Air Motor Hoists, Cranes and Trolleys.

THE GEORGE DELKER COMPANY, Henderson, Ky.: 1899 catalogue of Delker Vehicles.

NORTH BROS. MFG. COMPANY, Philadelphia: "The Ice Cream Freezer Book," relating to Gem, Lightning, Blizzard, Jumbo Lightning, Double Action Crown and Jumbo Lightning and Philadelphia Seaman Power Freezers.

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# Ohio Hardware Association.

## Fifth Annual Convention.

THE Ohio Hardware Association has the honor of being the pioneer in State organizations of retail Hardware dealers. The growth of the association has been gradual until within the past year, when a very great accession was made to the membership. The fifth annual meeting was held at Toledo on Wednesday and Thursday of last week, and was by all odds the most memorable event in the history of the organization. It was attended by George W. Cope of Chicago, the Western Editor of *The Iron Age*, from whom we have the following report.

### Phenomenal Growth.

The total membership on the day prior to the meeting was 107, but when the convention closed the list had swollen to practically 300. Such growth is extremely gratifying to the hard working officers of the association, and demonstrates the pitch of enthusiasm which has now been reached by the Ohio retail Hardware merchants. The selection of Toledo as the place of



*From Cover of Menu.*

meeting proved to have been fortunate, as it stimulated interest among the dealers of the northwestern section of the State, and drew from their number a large part of the additions to the membership.

### Officers' Efficiency.

The officers of the association during 1898, to whom great credit is due for the present efficient condition of the organization, were as follows: President, H. C. Wiseman, Springfield; vice-president, E. L. Harris, Columbus; secretary and treasurer, John F. Baker, Dayton; Executive Committee, W. A. Remy, Mansfield; O. M. Scott, Marysville; L. F. Stahler, Waverly; Frank Harrison, Toledo; W. P. Scott, McConnellsville; Geo. M. Gray, Coshocton; C. C. Fouts, Middletown.

### Admirable Arrangements.

The Toledo meeting would not have been such an enjoyable occasion as it proved but for the admirable arrangements for the convenience and entertainment of the visitors made by the local Reception Committee, of which Frank Harrison was chairman. Mr. Harrison devoted several weeks to the careful preparation of all kinds of details, so that when the convention met the members found that everything went like clock work. The citizens of Toledo were extremely hospitable and treated their visitors so royally that they will always have a green spot in their memories for the town on the Maumee.

A meeting of the Executive Committee was held at the Boody House at 11 o'clock on Wednesday morning to arrange some necessary details for the

meeting, but the session was not a long one, as nothing of serious importance came up for consideration.

### WEDNESDAY AFTERNOON.

The first session of the convention was held at 2.30 p.m., in one of the neat halls of the Pythian Castle, splendidly adapted to this purpose. The fine character of the assemblage and the large number gathered were inspiring to the officers of the association. Instead of a small meeting scattered over a waste of empty seats the hall was completely filled. Probably 400 members and visitors were in attendance, very few of the members being unrepresented. The following list will be of special interest to manufacturers, giving as it does the names of many of the most enterprising and progressive merchants of the State:

#### Members Present.

Lou F. Stahler, Stahler Bros., Waverly.  
H. C. Wiseman, Springfield Hardware Co., Springfield.  
Frank Harrison, Stollberg & Clapp Co., Toledo.  
D. R. McChesney, Stollberg & Clapp Co., Toledo.  
Charley W. Hayes, The Bostwick-Braun Co., Toledo.  
J. H. Smith, Creston.  
J. P. Duffey, Greenville.  
John F. Baker, Dayton.  
S. L. P. Stone, Stone Bros., Urbana.  
Tom J. Morris, W. K. Boone Co., Lima.  
James G. Reid, Pierson & Reid Hardware Co., Greenville.  
W. E. Spitler, Spitler & Clopper, Arcanum.  
G. W. Wiley, New Madison.  
G. A. Wolf, Wolf & Anderson, Hollansburg.  
B. M. Clark, Gettysburg.  
G. C. Miller, Ruhlman & Miller, Cardington.  
Smith De Muth, De Muth & Bowyer, Cardington.  
H. E. Rouse, M. I. Wilcox Co., Toledo.  
M. B. Talmage, Talmage Bros., Mt. Gilead.  
Chester D. Clapp, Toledo.  
T. M. Young, J. W. & T. M. Young, Forest.  
Will M. Crumrine, Crumrine & Kale, Salem.  
Frank Gerber, The Gerber Hardware Co., Ligonier, Ind.  
R. G. Bacon, Toledo.  
A. C. Rohrbacher, Rohrbacher & Allen, Akron.  
Adam Strome, Strome Bros., Warsaw.  
J. A. Meinerding, Schroeter & Meinerding, Ft. Recovery.  
H. G. Woodward, Sydney.  
C. R. Morgan, Pouchot, Hunsicker & Co., Akron.  
A. Jahant, Jahant & Weber, Akron.  
G. W. Schliesser, Toledo.  
C. H. Whitaker, Whitaker-Mitchell Hardware Co., Toledo.  
H. H. Bishop, McIntosh-Huntington Co., Cleveland.  
Chas. S. Johnson, Barberton.  
C. C. Fouts, Middletown.  
C. M. Waller, Waller Bros., Ravenna.  
W. P. Scott, Morris Hardware Co., McConnellsville.  
J. C. Conwell, Xenia.  
D. L. Wilson, C. E. Smith & Co., Malta.  
G. W. Wagoner, Stony Ridge.  
I. M. Chamborlin, I. M. Chamborlin & Co., McCutchnville.  
F. A. Walther, F. A. Walther & Co., Bucyrus.  
W. T. Hoffman, W. T. Hoffman & Co., Toledo.  
O. H. Russell, Russell & Gradople, Petersburg, Mich.  
Aug. Fischer, Jos. Nieuberg & Co., Glandorf.  
Luther Myers, Myers Hardware Co., Maumee.  
J. P. Vogel, Vogel & Bredbeck, Oak Harbor.  
H. C. Mylander, Oak Harbor.  
Andrew Kuster, Edon.  
W. A. Barnes, Barnes & Bowers, Brink Haven.  
Chas. K. Wolf, J. C. Conwell, Xenia.  
W. J. Lawrence, Lawrence & Brightman, Berea.  
C. A. Jewett, Geo. Worthington Co., Cleveland.  
O. P. Schriver, O. P. Schriver Co., Cincinnati.  
Chas. Boebinger, The Boebinger Hardware Co., Cincinnati.  
Jos. Drummer, Custar.  
T. W. Bodell, Harrod.  
J. G. Keifer, Edon Hardware Co., Edon.  
L. D. Boyer, Swanton.  
F. Briggs, Delta.  
F. W. Ingalls, The Bryan Hardware Co., Bryan.  
Arthur V. Riddle, E. W. Blizzaru & Co., Wauseon.  
F. B. Reynolds, Reynolds & Rychener, Wauseon.

- J. P. Howey, Howey Bros. & Sons, Bryan.  
 John W. Crissman, Crissman Bros., Delta.  
 A. J. Vernier, Vernier & McLaughlin, Archbold.  
 J. W. Brindley, Brindley & Brennan, Swanton.  
 J. J. Buehrer, Whitehorne Bros., Archbold.  
 E. G. Beucler, Stryker.  
 F. A. Fusselman, Edgerton.  
 W. K. Evans, Grand Rapids.  
 D. Counselman, McClure.  
 H. L. Leilich, Delphos Hardware Co., Delphos.  
 J. C. Wannemacher, Chas. Wannemacher's Sons, Ottonville.  
 O. O. Alspach, J. H. Kanke, Van Wert.  
 H. C. Groschner, Napoleon.  
 A. J. Mangas, Defiance.  
 Frank Ulrich, Ulrich & Sons, Napoleon.  
 M. Finan, Paulding.  
 J. L. Arnold, Napoleon.  
 M. Goodman, M. Goodman & Son, Whitehouse.  
 I. W. Cookson, Kansas.  
 J. A. Carr, Bradner.  
 Geo. Ash, Cosgray & Ash, Carey.  
 C. E. Kingseed, Kingseed Bros., Fostoria.  
 E. G. Laughlin, Laughlin, Brown & Houk, Carey.  
 John Spohn, Helena.  
 W. F. White, Shelby.  
 W. A. Remy, Remy & Bare Bros., Mansfield.  
 Robert Armatage, Attica.  
 Chas. A. Kuhlman, Kuhlman Hardware Co., Woodville.  
 J. W. Tebbe, J. H. Tebbe & Sons, Gibsonburg.  
 William Keil, Woodville.  
 J. A. Seltzer, Seltzer & Steele, Shelby.  
 H. H. Guyer, Bettsville.  
 D. S. Jones, Jones & Niver, Bowling Green.  
 A. J. Ross, Ross & Avery, Bowling Green.  
 C. C. Heller, Beaverdam.  
 A. D. Lugibihl, Bluffton.  
 O. M. Scott, O. M. Scott & Bro., Marysville.  
 L. D. Redick, B. K. Redick, Jenera.  
 T. D. Weld, Church Bros. & Weld, Marysville.  
 A. Augsburg, Kenton.  
 Roy E. Loomis, G. W. Loomis & Co., Bowling Green.  
 W. G. Kramp, Chaney & Kramp, Bowling Green.  
 John Fett, Bluffton.  
 G. F. Clark, the Clark Co., Clay Center.  
 J. H. Frederick, North Amherst.  
 W. J. Bailey, Millbury.  
 John E. Plato, J. Wesbecher & Co., North Amherst.  
 Adam J. Smith, J. F. Donahue & Co., Sandusky.  
 A. R. Kanney, Green Springs.  
 A. W. Overmyer, Lindsey.  
 T. Skilliter, T. Skilliter & Sons, Genoa.  
 L. N. Bryant, Jaeger & Bryant, Genoa.  
 Chas. B. Harner, Nichols & Harner, Bellefontaine.  
 J. E. Bunn, Bellevue.  
 Geo. E. Jefferson, Whitbeck & Jefferson, Norwalk.  
 Richard Bell, the Farm Implement Co., Elyria.  
 Gustavus Jaeger, Elmore.  
 E. E. Barch, Elyria Hardware Co., Elyria.  
 Hubert Day, Elyria.  
 Wm. Millspaugh, the Farm Implement Co., Elyria.  
 H. M. Belsom, J. E. Bern, Bellevue.  
 F. A. Powers, F. A. Powers & Co., Norwalk.  
 J. A. Krautz, Heldmyer Hardware Co., Elyria.  
 F. I. Ruhl, E. Blair, Bucyrus.  
 C. Morgan, Ohio Glass & Hardware Co., Akron.  
 A. J. Maurer, H. W. Lueckemeyer & Son, Cleveland.  
 S. C. Thornton, Cleveland.  
 Henry F. Rake, the Mitchell Bros. Co., Cleveland.  
 Charles Michel, Cleveland.  
 Jno. S. Spoerle, Hamilton.  
 W. H. Angle, Piqua.  
 A. L. Shearer, Roney & Shearer, Dayton.  
 Jas. B. Carson, Hamilton.  
 J. M. Martin, Martin & Weinland, McComb.  
 J. J. Ewing, Lima.  
 I. N. Woodcox, DeWeese & Woodcox, Piqua.  
 I. R. Tudor, Jones & Tudor, Van Wert.  
 E. F. Weinland, Martin & Weinland, McComb.  
 Samuel Williams, Vaughnsville.  
 J. H. Doering, Wapakoneta.  
 Edward Fischer, Fischer Hardware Co., Wapakoneta.  
 G. B. Hatfield, H. L. Hatfield & Bro., Troy.  
 John C. Schaible, Coles, Schaible & Smith, Troy.  
 R. J. DeWeese, DeWeese & Woodcox, Piqua.  
 Robt. P. Jones, Thos. R. Jones & Son, Lima.  
 H. W. Hobart, Hobart-Bowlus Co., Pemberville.  
 Edward Kell, Wm. Kell & Son, Pemberville.  
 A. L. Durbin, Herring.  
 Fred Haberman, Marion.  
 Lovell Householder, C. W. Jewell, Utica.  
 H. L. Kuenzli, Blaser & Kuenzli Bros., Nevada.  
 G. V. Guyton, Ada.  
 Richard O. Guthke, Mayer & Guthke, Columbus.  
 James Cockrell, Wheaton & Cockrell, Sunbury.  
 Geo. M. Gray, Gray Hardware Co., Coshocton.  
 W. C. Bale, Westerville.  
 George Rothrock, Geo. Rothrock & Co., Ada.  
 Phil. Starrell, Adams & Starrell, Wills Creek.  
 B. W. Payne, Payne-McDonald Hardware Co., Columbus.  
 J. H. Calkins, W. R. Calkins & Bro., Columbus.  
 Benjamin Coe, Excelsior Hardware Co., Coshocton.  
 J. W. Brown, The Brown-Potter Hardware Co., Washington C. H.  
 C. B. Burr, Blackwood, Green & Co., Columbus.  
 J. M. Weibling, Weibling & Patrick, Westerville.  
 Frank Winter, Maccracken & Winter Hardware Co., Lancaster.  
 C. D. Cussins, Cussins & Fearn, Columbus.  
 James A. Bell, Sykes & Bell, Roscoe.  
 Will C. Jones, Jones-Williams Hardware Co., Columbus.  
 E. L. Harris, J. S. Abbott & Co., Columbus.  
 W. B. Bogardus, Bogardus & Co., Mt. Vernon.  
 Thos. A. Castell, Castell & Harbaugh, Murray.  
 M. W. McCready, M. W. McCready & Co., Ashland.  
 Geo. H. Eberle, Lion Hardware Co., Springfield.  
 A. F. Price, Fremont.  
 R. D. Henderson, Singer & Henderson, Weston.  
 M. A. Griffith, Madisonville.  
 A. D. Hogendobler, Osborn.  
 H. P. Davidson, Cleveland.  
 H. A. Harger, Canal Dover.  
 C. A. Bird, Wm. Bird, Mount Vernon.  
 J. Q. Riddle, the Lockwood-Taylor Hardware Co., Cleveland.  
 C. J. Blackmon, G. M. Blackmon's Sons, Painesville.  
 W. W. Osborn, Osborn & Churchill, Bellefontaine.  
 John Plummer, Bellefontaine.  
 J. K. Milligan, Bellefontaine.  
 F. B. Easton, Bellefontaine.  
 J. C. Raabe, C. Raabe & Sons, Fort Jennings.  
 C. E. Brigham, Wauseon.  
 T. E. Shuter, Snider & Shuter, Evansport.  
 Chas. McLaughlin, Vernier & McLaughlin, Archbold.  
 C. R. Shuter, Snider & Shuter, Evansport.  
 David Huyck, Swanton.  
 F. H. Whitehorne, Whitehorne Bros., Archbold.  
 R. L. Magee, Briceton.  
 H. C. Cantfield, D. W. Cantfield & Son, Whitehouse.  
 E. S. Perry, Fayette.  
 M. V. Garver, the Bryan Hardware Co., Bryan.  
 C. W. Crawford, Toledo.  
 G. H. Blaker, Maumee.  
 D. R. Myers, Myers Hardware Co., Maumee.  
 L. W. Buzzard, Biddle & Buzzard, Toledo.  
 J. H. Smith, the Smith Bros. Hardware Co., Columbus.  
 John H. McCune, McCune, Owens & Co., Newark.  
 E. W. Ervin, Ervin Bros., Jackson.  
 R. H. Miller, Bellevue.  
 A. E. Quidort, the Pioneer Hardware Co., Pioneer.  
 Wm. Gockel, Florida.  
 Henry Behnfeldt, Okalona.  
 W. O. Hughes, W. O. Hughes & Co., Hicksville.  
 M. V. Wolf, Wolf Hardware Co., Toledo.  
 J. H. Dominy, Creviston & Dominy, Lewisburg.  
 F. E. Palmer, Palmer & Lippincott, Columbus Grove.  
 Ed. Wedekind, Henry Bredbeck, Port Clinton.  
 E. L. Frey, Ottawa.  
 S. L. Irwin, Tontogany.  
 E. S. Peny, Peny & Carsons, Leipsic.  
 John A. Parsons, Perry & Parsons, Leipsic.  
 B. J. Howey, Howey Bros. & Sons, Bryan.  
 T. J. Coslet, Churchman & Coslet, Bryan.  
 H. L. Beatty, Rocky Ridge.  
 D. J. Farnsworth, Farnsworth Bros., Waterville.  
 L. W. Goodman, M. Goodman & Son, White House.  
 J. J. Fauner, J. J. Fauner, Ridgeville.  
 Geo. W. Moore, Tiffin.  
 F. M. Gensel, Gensel & Smith, Malinta.  
 W. H. Saylor, Portage.  
 W. D. Skilliter, T. Skilliter, Genoa.  
 John Amon, Perrysburg.  
 J. A. Gibson, Sidney.  
 C. K. Bristol.  
 Star Hardware Co., Toledo.  
 E. A. Eversman, Toledo.

President Wiseman opened the convention with the following

#### President's Address.

In this year of our national prosperity, so long promised us and so welcome in its coming, and among this gracious people of the City of Toledo, it becomes my pleasant privilege as your presiding officer to offer you greeting and congratulation at this, the initial meeting of our fifth annual gathering, which I do right heartily.

The past few months and the weeks of the new year have given us assurances from very many sources that this meeting would bring us together with more of inter-



est, with an added membership, greater than we have ever known, and our mutual greetings could be only more cordial, more heartfelt and more a subject for congratulation, in that they extended still nearer toward each one of the 1100 retailers of our State—and yet there is cause for felicitation in the many new faces that have come among us to-day; we trust each one of them with the purpose in hand of adding their names to our roll, and leaving us enthusiastic members, anxious to help on the good work.

#### IT IS A HOBBY

which I am sure you will bear me out in riding—this harping on increase in numbers. It becomes more than a hobby—it is a necessity; if we stand for organization at all, if we stand for progression and for the upbuilding of the trade; if we stand for success and are in earnest in our efforts, it is a paramount truth that individual conflict can never reach where concerted action succeeds. The few State associations already held are a revelation in their growth and enthusiasm, and manufacturers and jobbers throughout the country, as well as the traveling salesman and the conservative dealer who has waited for results, begin to realize that we not only may be, but are, a power—not for evil toward them, not for antagonism toward any, but for good in all things.

#### THERE ARE RIGHTS AND WRONGS.

We do our best to secure the former; we have, unsought, our full share of the latter; and in our gatherings seek to rid ourselves of these, rather through a plain statement of facts than that ever the cloven foot or the spirit antagonistic should be shown.

In the earlier days of our conventions, when seemingly it was not understood that the associations meant trade loyalty, new and stronger friendships, intelligent legislation, correct lines of merchandising, and the upbuilding of our business, manufacturers and jobbers stood aloof, even the men most interested, our neighboring retailers, smiled, and got in out of the cold—quite a good many of them are not yet out.

I remember some cases in which complaints were entirely ignored, letters remained unanswered, and others went so far around to avoid the issue that it was necessary to restate it time and again. The contrary is quite the reverse at present. We have that attention we will always command, other than as we become a majority it will increase, and instead of deliberate trade violations we will note care, question, and to a certain extent, permission sought where it be a question.

#### RAILROADS AND EXPRESS COMPANIES

are two of the shadows that continually cross the path of the man in business; the former, more just in all matters than the latter, except it be in the line of claims—and a claim for damage against a railroad has come to be a joke, whether it be for losses or for goods broken in transit. Both subjects need the attention of the Hardware Association, the law-makers and the business men. In the matters of discrimination and overcharges it is almost impossible to find recourse. Until now it has been understood that for the future we were to be loaded with the incubus of 30,000 pounds as a minimum carload. On the eve of our association meeting, we thank the powers that be, this action has been rescinded and we return to the old basis of 24,000 pounds.

As to express rates, there is no explaining them. Their values should be little beyond that of a common carrier. There is no comparison as to values with rates; we are simply robbed right and left, and on all occasions. We hope and trust every association will aid the Merchants' Association of New York in its efforts for lower and equitable rates, based on a valuation of shipments, or those now in existence so scaled that in these days of hustling merchants goods may be laid at our doors by these monopolies not entirely devoid of profit.

#### OUR INFLUENCE.

we cannot but feel, will always be for the good of the trade, and never to its detriment. The natural growth

of each association in the last few years, and their deliberations, have made this a manifest truth. It has already shown its values in our system of accounts and credits, in our collections and their methods, in our payments for purchases, in our treatment of the traveling man and the house he represents, in our neighborly spirit toward our competitor whom we once ignored, in our bettered methods throughout. Were there no other results, had we naught to ask of jobber and manufacturer, of our law-makers, of our traveling visitors, this organization would be worth more than it has cost us. It is the testimony, voluntarily given, of nine men out of every ten who take part with us.

#### HAVE WE ACCOMPLISHED ANYTHING?

The question is often asked, and the answer always comes, Yes. We are recognized, we are known throughout the length and breadth of our country. We have individually and collectively sought trade concessions, and in many cases received them. We have interested legislators who are now framing for us laws of lien and of collection, whose absence on the statutes heretofore have cost us many dollars. The lines of trade are being more closely followed—the retailer is a retailer, the jobber a jobber, in fact; and in time, through our persuasive powers, we hope to close the door of the peddler to the consumer. We all of us have had, and will have, the department store and the catalogue house with us; and have learned much of how best to war with them in using their own ammunition. We have assurance from some makers and jobbers of goods that they prefer not to sell this class of trade. We have it from one of the largest corporations in America that, beginning with the coming month, they will hereafter sell strictly to the Hardware trade. We hope to see our way toward carrying our own insurance. We are charged a rate exorbitant, we are classed in every case and in every city the same as lines ten times as likely to burn. I feel sure that in time a plan of mutual insurance will result, a saving of thousands to the Hardwaremen of the State.

#### AS TO A NATIONAL ASSOCIATION.

I don't feel like going by a question that seems to have developed into one of importance. We have 45 States, 10 of them have associations. While they are all strong, healthy and growing, let me submit my view of the agitation on the subject: Are we ready just yet for a national organization? Are we large enough, strong enough, and are there enough of us to constitute one, if organized? We do not want to make a second failure, admitting that the conditions are not now what they were when the first one was attempted. Will it not be time enough to talk National Association when at least one-half of the States are represented with their own? We want to be a power in the land when that time comes; we want it to be a great success. I believe in it faithfully, believe the time will come for it, and will take great care and interest in helping to further it, but I do believe that an expression should be had at this meeting which will place us on record as against it just yet. We want a National Association, when the time comes, to bind together all our State associations, to add strength to our own, and to make strength for its members. Let us make haste slowly in this matter.

#### THE WORK OF THE YEAR

is in partial evidence before you in the number present here to-day, among those who have come long distances that they might know the pleasant experiences of former years, and in our new members whom we welcome with us. There has been great missionary work this year among the members by the Executive Committee through trade journals, and let us not forget it. Our traveling friends have served us well in this respect and on all occasions. I want to thank the Executive Committee for what is certainly the best year's work ever shown by any committee, and this without reflection, since it consists of seven this year, and but two before. Hard, untiring, individual work has been given to these

seven, and the results will show. And now, gentlemen, in closing, I feel that each one of us, personally, is under lasting obligation to our genial secretary, than whom I believe there was never a harder worked man. His is truly a labor of love and loyalty, a thankless job, unless he accepts the full measure of our gratitude in part payment. His report will give you fully and in detail the actual work that is beginning to be a part of a growing organization.

#### Mr. Baker's Report.

Secretary Baker read the minutes of the last annual meeting and also a letter from the traveling men of Ohio present at the last convention expressing their thanks for the courteous treatment received from the association. Mr. Baker then presented his report as secretary and treasurer, from which we make the following extracts:

When our fourth annual session convened at Columbus last year our membership numbered 65 firms. During the session there were 26 names added, making a total membership of 91 at the close of the session. Since that date five firms have withdrawn, two having discontinued business, and three on account of lack of interest. During the year we have received the names of 21 firms, thus making our membership at this date 107. Our increase during the year has been the largest of any one year since its organization, and while it is not as large as it should be, yet the growth of our association has been, on the whole, slow, solid and sure.

The Ohio Association, as is known, is one of the pioneers, and yet it has not grown as rapidly as the far Western associations, the only reason I am able to give being that our dealers have not felt the incursion of the department store or the catalogue houses as the Hardware dealers of Wisconsin, Minnesota or Iowa have.

#### EXECUTIVE COMMITTEE'S WORK.

The Executive Committee have labored very zealously during the year. The change in the number of the committee, from two to seven, has proven to be the part of wisdom. Coming as they do from the different parts of the State, and uniting their ideas regarding the work, has inured to the benefit of the association, and the result has been that we have reaped the benefit therefrom.

#### PRAISE FOR MR. HARRISON

Great credit is due Mr. Harrison of the committee for the major part of the work. Earnestly desiring that the session at Toledo should be the best ever held in its history, he has worked early and late untiringly for its best interests, and whatever success we have at this session is, in a great measure, due to his individual efforts. In the hope that the secretary will not be charged with exaggeration, he ventures the remark that if every member of our association had consumed the amount of postage Mr. Harrison has the Post Office Department itself would in a short while dispose of the national debt.

#### ASSOCIATION CORRESPONDENCE.

As stated in my last annual report, the secretary has had considerable correspondence in regard to our association. Inquiries have come from all parts of the Union as to its aims and objects. In every instance these inquiries have been answered at length, and in several instances at great length, in order that the association ideas may grow and succeed in every portion of our land.

In quite a number of instances dealers desiring to form city or county associations have written the secretary for instruction and information, and at such opportunities the secretary has used his best efforts to promote such organizations.

#### HAN INTERMEDIARY

It will also cause the members some surprise to learn that in not a few instances he has been enabled by correspondence to assist a number of dealers who desired to sell their establishments to find other dealers who were anxious to purchase.

It will thus be seen that if our association suddenly went out of existence the loss to the Hardware trade in Ohio would not be inconsiderable.

#### MANUFACTURERS AND JOBBERS.

Since last we met we have had but two complaints brought prominently before our Executive Committee. Under direction of the Executive Committee the secretary has had the following correspondence:

\* \* \*

It will thus be seen that the manufacturers and jobbers are realizing, more and more, the importance of our association, and if the Hardware dealers of our State could but know the value of an organization which in its very nature is bound to be a guardian of their rights they would quickly come forward and join us, thus protecting themselves and strengthening the association.

#### INDIVIDUAL WORK IMPORTANT.

On November 30 last the Executive Committee held a meeting at the Hotel Chittenden in Columbus, for the purpose of making preparations for the coming session. All the members were present but one, who was unavoidably detained. The secretary makes mention of this fact, that the members may see that the Executive Committee are alert and faithful to their duties, and yet while great praise must be given our committee for the work they have done this year, the secretary insists, as he has done before, that our association will grow more rapidly if each individual member will make it a personal matter to push the interests of our association, and work for the increase in its membership. At the meeting of the committee the opinion was expressed that the trade should be thoroughly aroused regarding the coming session, and to this end an address was prepared by the committee and mailed to every dealer in the State.

That the dealers in our State have been well informed is no news to our membership, as may be seen by the numerous messages sent through the mail. We have over 1100 *bona fide* Hardware dealers, and shall not discontinue our efforts until the larger part of this number are found in the membership of our association.

In view of the fact that we are in need of printed constitutions, the secretary offers a suggestion that, since the present constitution and by-laws are somewhat crude and inadequate, a committee be appointed to revise the same, and that the Executive Committee be empowered to have a quantity printed.

#### NATIONAL ASSOCIATION AND EXPRESS CHARGES.

The secretary has also received a communication relative to the formation of a National Hardware Association, and suggests that some action be taken regarding it, also a communication referring to the matter of excessive charges by the various express companies, which might be discussed with some profit by our own association.

In conclusion the secretary desires to extend to the members his personal thanks for the confidence reposed in him for the many expressions of friendship he has received and for the numerous acts of kindness shown.

#### Grievances Against Jobbing Houses.

The report presented details concerning grievances against jobbing houses which had been sent to the secretary by some of the members and had been the subject of considerable correspondence. The correspondence read was specially interesting from the demonstration given of the very courteous and conciliatory character of Mr. Baker's letters and his evident disposition to promote amicable relations rather than to create irritation and cause a feeling of unfriendliness between jobbers and the association. Too much stress cannot be laid on the manner with which correspondence of this kind is conducted, as it frequently happens that an apparent injustice to retail dealers is susceptible of satisfactory explanation.



The report of the secretary was approved by the convention, and a vote of thanks was given to him for the manner in which he had performed the duties in the past year.

Considerable time was spent in the payment of dues and receiving applications for membership.

A letter was read from the ex-Lieutenant-Governor of the State, W. B. Marquis, a Hardware dealer, who is now in Florida, regretting his inability to attend the meeting.

An invitation was also read from the Snell Cycle Fittings Company to visit their factory in Toledo.

#### H. H. Bishop's Address.

H. H. Bishop of the McIntosh-Huntington Company, Cleveland, and president of the National Hardware Association, was introduced and addressed the convention, expressing his pleasure in meeting so many members of the Ohio Hardware trade and his intention to be present at the sessions of the convention and participate in the discussions. He said that when people gather in an association it is important for them to know what they want. They should make up their minds on this point and work to that end. He explained that the National Association has well defined objects and is working to carry them out. It is an association of jobbers now numbering 147 members and covering 85 per cent. of those eligible to membership in it. Its objects are purely friendly in their nature, intended to cultivate a better feeling among the members and all those connected with the Hardware trade. It is not inimical to the retail dealers, although its prime object is of course a selfish one, being directed to the promotion of the interests of the jobbers. The wholesale trade of the country is in accord with the retail interests and endeavoring in every way to promote the welfare of the retailers, who are its customers.

#### Question Box.

The president appointed the following committee to examine the contents of the question box, eliminate duplicates and select for discussion such questions as were of the most interest and likely to lead to the greatest benefit of the members: Messrs. Winter of Lancaster, Gray of Coshocton and Woodward of Sidney.

#### Committee on Resolutions.

The president also appointed the following Committee on Resolutions: Messrs. Morris of Lima, Angle of Piqua, Duffy of Greenville, Bogardus of Mount Vernon and Davidson of Cleveland.

Announcements were made by Frank Harrison relative to the entertainment of the members by the Toledo merchants and manufacturers.

### WEDNESDAY EVENING.

The annual banquet of the association was held in a capacious and beautiful room in the Odd Fellows' Building. The banquet was notable for the absence of liquors. The menu was an excellent one and was enjoyed by about 500 persons. After the coffee and cigars the following programme was carried out:

#### The Programme.

<i>Prayer,</i>	Rev. E. W. HUNT.
<i>Address of Welcome,</i>	Hon. S. M. JONES.
<i>Reply</i>	President H. C. WISEMAN.
<i>Solo,</i>	B. W. PAYNE, Columbus.
<i>Address,</i>	H. H. BISHOP,
President National Hardware Association, Cleveland, Ohio.	
<i>Violin Solo.</i>	EDWARD FROEHLICH.
<i>Ideals,</i>	W. B. BOGARDUS, Mt. Vernon.
<i>Topical Song.</i>	B. W. PAYNE.
<i>A Condition.</i>	Hon. FRANK B. NILES.
<i>Violin Solo.</i>	EDWARD FROEHLICH.
<i>The Iron Age.</i>	G. W. COPE, Chicago.
<i>Song,</i>	S. R. GAINES

The following address was made by H. H. Bishop on the subject of the

#### Avenues of Trade.

In the aggregation of States which go to make up this glorious Union by no means the least important is the State of Ohio. We, who are its citizens, may justly contemplate with satisfaction its vast and varied resources and industries. Its mines, its farms and its work shops, and with pride its men, both past and present, who have been and are prominent in the manufacturing, commercial and political world.

#### IN COMMERCIAL LIFE

the dealer in Hardware has for many years been looked upon as the symbol of solidity and worth. The occupation is one which naturally attracts men of honor and capacity and repels those who aim to attain wealth and apparent success by questionable methods.

It is fitting that the first organization for mutual benefit and improvement among merchants in this trade should have had its birth in this great State of Ohio, and that the example thus set should have been followed by others, and those among you who were its original founders may be justly proud of the result of your efforts.

I realize that on an occasion of this kind it is customary to treat or bore (as the case may be) the assembled guests with jests and merriment, but, unfortunately, nature has not endowed me with those gifts, and I cannot pose before you as a Chauncey Depew without too great strain upon your imagination and your patience. If you are wearied, blame it on your president and Executive Committee, who honored me with the invitation. With your kind permission, therefore, I will speak for a few moments upon the "Avenues of Trade."

This subject is a broad one, but for our present purpose may be restricted to the branch in which we are all directly interested:

#### MANUFACTURED HARDWARE.

To my mind this subject is of importance to this association, as it is well for you to determine where your rights as dealers begin and where they end, and contend for their respectful consideration by others. The original source of all your supplies must be the factory, and from this, as from a reservoir, flows the daily production. Its natural outlet is into the hands of the wholesale dealer or jobber, so-called; from thence to the retail dealer and from him to the user or consumer. These are the

#### NATURAL AVENUES OF TRADE,

and to its restriction within these natural bounds the attention of your association and all other similar bodies should be directed.

We may, with propriety, consider the functions performed by those who are in control of these avenues.

#### THE MANUFACTURER,

according to the class of his product, chooses a location adapted to his wants where the elements of labor, fuel and supplies may be obtained most economically. He is, or should be, a producer of wares that are adapted to the wants of the people, should manufacture them with care, honesty and the utmost economy. He should obtain for his product a margin above the cost that will fairly compensate him for his time, return a fair interest upon the money invested in the plant, allow for reasonable wear and tear on machinery, and, above all these, enable him to pay a fair wage to the labor which he employs. In order to accomplish this he should not be burdened with the unknown and unknowable expense of marketing his goods in small parcels but should dispose of them at fair prices to distributors of large quantities, or in other words, to wholesale dealers.

#### THE WHOLESALE DEALER

In his turn should bend his energies toward the accumulation under one roof of all the varied articles of manufacture that go to make up the stock of a Hardware dealer, and which will be drawn, as experience shows,

from thousands of sources. He should select his stock with intelligence, adapting it to the wants of the trade, rejecting articles without merit, sizes of little value and avoiding extremes in all directions. He should distribute these to the retailer at a fair advance over cost, such as will pay him, as has been paid to the manufacturer, a fair return for his own time, interest on money invested and, as before, sufficient to pay his employees a liberal wage.

#### THE RETAIL DEALER

in his turn should select from the stock of the wholesaler such articles as are adapted to the wants of his own constituency, purchasing them only in such quantities as he can dispose of in a reasonable length of time, and in turn dispose of them to the consumer at such advance over cost as will compensate him, as has been the manufacturer and wholesaler before him.

These are the natural, the proper avenues of trade for the distribution of manufactured Hardware. But is its distribution being carried on in this way? Your knowledge and mine will enable you to answer promptly, No.

#### CERTAIN MANUFACTURERS

have elected to distribute their product without the intervention of the wholesaler; with such there can be no quarrel if they do not seek the trade of the wholesaler also; but some, after marketing the major portion of their product to the wholesaler at a minimum expense, solicit the trade of the retailer at the same prices or substantially the same as those they make to him, and then chuckle to themselves to think that they have disposed of so many goods without expense.

#### SOME EVEN GO FURTHER

and seek the trade of large department stores and catalogue houses, selling them at prices that will not admit of competition on the part of the legitimate retail dealer, whereas they should be treated with, if at all, upon an equal basis.

These practices have grown to such a point that they have brought about the natural results of some wholesalers seeking business from consumers, which they would never dream of nor have the desire for if these conditions did not exist, and in consequence you as retailers have come upon evil days, and must bestir yourselves to bring trade back into its proper avenues or succumb to the inevitable.

#### CONDITIONS MUST BE CHANGED.

The subject is one which will admit of lengthy dissertation, which would be inappropriate on this occasion. I have the misfortune to be a wholesaler and know from experience the just ground of complaint which both wholesalers and retailers have. I have also the honor to be the president of the National Hardware Association of the United States, which is composed of 85 per cent. of the wholesale Hardware dealers of the country, and while I do not come before you in that capacity but simply as one of your own number, I can say to you that this association is in hearty accord with the objects that you have in view. It occupies to you the attitude of a friend, and will be glad to add its influence in forwarding acts of yours that will tend to bring back a normal and healthy condition which will afford just compensation to all engaged in trade, whether as manufacturer, wholesaler or retailer. It can never be accomplished until conditions alter so that the laboring classes, your principal customers, by increased earnings have greater purchasing power than at present, and this cannot come about until the greedy strife for business is in some measure controlled and directed along the legitimate avenues of trade. The proper presentation of these foundation principles then is the important work that you can do, and I have faith to believe that these views presented in a conciliatory and logical manner cannot fail to make an impression upon all those with whom you do business. Take for your motto then that good old rule which is a synonym for fairness the world over, "Do unto others as you would

have them do unto you," and to encourage you if efforts do not meet with immediate success that other maxim, "Right makes might."

#### THURSDAY MORNING.

The session opened with an interesting address on the manufacture of Pocket Cutlery by J. W. Schatt of the New York Cutlery Company, Gowanda, N. Y. Mr. Schatt explained the difference between the methods pursued in Germany and in this country in the manufacture of Pocket Knives, and made his remarks more intelligible to his hearers by exhibiting the various parts of a Knife and the material from which the parts are made in the various stages of completion. He showed his hearers that the process of manufacture is a much more complicated matter than they had supposed, and they were given a number of practical and valuable points by which they will hereafter be able to judge more accurately of the comparative values of different knives.

#### Hugh A. Cole's Remarks.

Hugh A. Cole, president of the Iowa Retail Hardware Dealers' Association, was introduced to the convention and told the members of the success which attended the work of organization in his State. He congratulated the Ohio Hardware Association as the pioneers in organizing the retail Hardware dealers of the country, and said they should be proud of the children they now had in so many different States. Referring to the growth of the retail associations in the Northwest, he said that they all have about the same conditions to face and must meet them in the best possible way. He mentioned that certain ideas should be pursued in order to secure the best results. He maintained that if advertising is good for the department stores and supply houses, it is a very important matter for retail dealers. He pointed to supply houses which are now apparently very successful that have sprung up within the past five years, and have attained their importance very largely through advertising. He also said that the life of the retailer is in

#### HANDLING SPECIALTIES.

and that he should endeavor to do this as much as possible. Care should be taken to avoid deceptive advertising. Efforts should also be made to secure the passage of laws to prevent merchants from deceiving the people in their advertisements. He said that retail merchants should advertise their cheapest goods, so as to show their customers that low prices can be made by the Hardware merchant, but when customers come in the best goods should first be shown them and efforts made to dispose of such articles, not only because of the profit to be made, but of the certain satisfaction which such customers are sure to feel afterward.

#### THE QUESTION BOX.

The association proceeded to the discussion of questions which had been placed in the question box. Chairman Winter of the committee appointed to arrange the questions stated that they had gone over the questions very carefully and had selected what they thought were the best calculated to draw out discussion. The first question read was as follows:

*What is your opinion of the magazine advertisements of the National Shear Company in endeavoring to sell direct to consumer?*

This would have brought out a good deal of discussion because it was a subject that had been considered privately by many of the members and they were prepared to indulge in rather caustic criticisms of the company, but they were forestalled by the statement by W. H. Angle of Piqua that this subject really came under the view of the general resolutions adopted by the association at the Columbus meeting in 1898, and therefore it was unnecessary to take up the matter of the company's policy as a topic for general discussion.



*What shall be done with jobbers who send their traveling representatives to solicit your orders and another representative to solicit orders from the factories in your town, in some instances accepting orders from employees for tools?*

This question was discussed by Messrs. Jacobs, Davidson, Reid, Weld and Kanney. Instances were given of such practice, but questions asked developed the fact that they had not written to the secretary of the association as freely as they should have done in advising him of grievances of this character, so that he could take them up with the parties who were objects of complaint and endeavor to have a satisfactory arrangement made. The chief trouble, according to several, was found in the sales to blacksmiths and to small factories whose trade legitimately belongs to the local Hardware dealer.

*What are the real aims and objects of this association?*

The president answered this question by stating that not until now had the association been in proper condition to carry out its genuine purpose. The membership had fortunately increased to such proportions that the association could take a stand on important matters and back them up by the influence which comes from strength. Legislation is needed on lien laws, closer relations must be established with jobbers, retail dealers must be protected in their local trade, sociability must be promoted among retail dealers themselves; in fact, any number of objects are to be secured by an organization of this character, all of which will inure to the benefit of the retail dealers.

*Why do express companies collect the revenue tax from their customers? Is it legal? Can we do anything in this matter?*

Mr. Scott said that if any one wished to bring suit against an express company for the 1 cent which he is obliged to pay for the stamp on an express receipt he is at liberty to do it and find out if the express company have the right to make their customer pay for the stamp. Suits of this kind have been brought in several cities. However, if the express companies are fought to a finish in this matter and are compelled to pay for the stamp themselves, they will simply make their charges higher and cover the cost of the revenue stamp in another way. We can only express our indignation in a resolution and let it go.

Mr. Cole made the suggestion that the Committee on Legislation should be instructed to petition representatives in Congress to put the express business under the control of the Interstate Commission along with the railroad business.

Mr. Harrison thought the way to get at this question was through the movement started in New York by the Merchants' Association.

*In a certain section of the State the Pharmacy Association claims that under the State laws Hardware stores have no right to sell Paris Green and Borax. Is this correct?*

Mr. Meinerding of Ft. Recovery said that he had been advised on this point, and that his practice was now not to break packages, but to sell the articles in the original packages in which they came to him, and that this was a compliance with the law.

*Why should not the association combine on buying Nails, Wire, Hinges, &c., and employ a purchasing agent for the members?*

Mr. Winter thought the proper time had not come for such action. When the association has 400 or 500 members an agent could properly be employed, with his headquarters in New York, where he will be in position to get prices from manufacturers, and could then issue a weekly letter to the members advising them of prices and giving his opinion when to buy.

Mr. Jacobs thought this would be all wrong, as the members do not seek to be jobbers, but are retailers.

Mr. Cole said that he had never saved a cent by buy-

ing Nails or other goods in car lots. He found that jobbers will handle Nails on a margin of 5 cents per keg or less, and that they can take the chances of the market going against them. He had bought at times to get the carload price when he had afterward been obliged to carry the Nails for a considerable period, and not only lost the use of the money invested, but found Nails go down considerably.

Mr. Scott did not think it would be advisable to have a purchasing agent, believing that it looked like the old granger movement among the farmers.

*What kind of advertising pays?*

Mr. Scott thought the kind that paid was what every man would be obliged to work out in his own experience.

Mr. Cole advised system in advertising and the persistent use of local newspapers, but with frequent changes in advertisement and direct reference to such goods as were in season.

Mr. Bogardus said this was one of the most perplexing questions. It seemed to be entirely one-sided, and that on the side of the newspapers. He had been advertising in the local newspapers, but could not see that any advantage had been obtained in this way. He would like to know the best method of getting people into his store.

Mr. Jacobs thought that not much profit was realized from newspaper advertising in small towns. He preferred to spend his money in giving bargains to his customer. He advertises in a local paper, but mainly to help support the paper and not because he finds it of value.

Mr. Gray claimed that advertising pays, but that it must be regularly attended to. He has adopted a plan that has brought better results than anything previously tried. At the beginning of every month he writes a special letter to the leading farmers in his vicinity calling their attention to some article and finds that this letter brings out excellent results.

Mr. Cockrell, who lives in a town of only 500 inhabitants, said that a small paper was published there which had a circulation within a radius of 15 miles. He uses a quarter of a page in this paper, and changes the advertisement every week. It is true that all the people know where his store is, but in this way they also know just what he has to sell and what is suited to the particular season, and in this way they are steadily kept interested in his stock.

Mr. Stahler said that his mode of advertising is by circular letter. Only last week he mailed 2500. He takes the county directory, and twice a year sends out a letter to each one in this directory.

Mr. Schatt said that the best point in connection with advertising is originality in methods, and called attention to books which had been published on this subject giving valuable hints to advertisers.

Mr. Davidson gave some points about Cleveland advertisers who display considerable originality in their methods.

Mr. Black, who comes from a town of 9000 inhabitants, said that he carries an advertisement steadily in a local paper. He gets a humorous cut from a concern furnishing cuts of this character at 50 cents each, and puts in his advertisement together with references made to special articles offered by him at that particular time. He changes the windows in his store, so that the display in the window corresponds with the change whenever made in the advertisement.

*What is the best mode of collecting?*

Mr. Scott said that he had adopted an original system of collecting dormant accounts. He writes a statement and sends it out as a registered letter. This works peculiarly. The debtor gets a notice from the postmaster that a registered letter is waiting for him, and as such things are rare in his experience he goes as quickly as possible to the post office expecting to get a remit-

tance from somebody who owes him. The contents naturally strike him much more forcibly than if it was just a dun or bill received in the ordinary way, and he usually wakes up and tries to pay it. This method offends some men, it is true, but he finds that the man who is offended is usually the man whose patronage could well be lost. When he gets a promise to pay in a certain time he always makes note of the time, and punctually calls the man's attention to it, but he finds that the registered letter is the cheapest and best method.

*We have two lumber dealers in our town who take contracts for erecting buildings and buy all of their Hardware direct from jobbers. Is there a remedy?*

Mr. Cole suggested that when a grievance of this kind is laid before the secretary he should correspond with the secretary of the Lumber Association, which is an exceedingly strong organization designed to protect the interests of the lumber dealers, and therefore anxious to preserve proper relations with organizations in other trades. An appeal to their honor, he thought, would be effective.

Mr. Bishop said that this matter unquestionably constituted a grievance of which dealers could rightfully complain. He thought the proper method to pursue was the conciliatory one. The jobber tries to do his business in a proper manner, and if his attention is called to such matters the practice will be stopped. Two sides are, however, found on every question. Extenuating circumstances often exist. He thought that such practices are not common, but are found only in a few localities.

Mr. Duffey said that Hardware dealers often handle lumber as a side line, while lumber dealers handle Hardware as their side line. Competition of that kind is found in his own town, and the Hardware dealers were obliged to start a lumber yard, which they found a good thing, having made a satisfactory percentage of profit on their investment.

Mr. Reid said that if looked into it would be found that jobbers often sell to lumber dealers because they do not get any business from the local Hardware dealers. It is not possible for Hardware dealers to buy from all the jobbers whose traveling men visit them.

Mr. Kanney said that jobbers should not expect to sell in every small town. No jobber should go to consumers even if he had no customer in that town.

Mr. Grave thought that many things could be adjusted without using the association as a club. He gave an instance in which he had a grievance of this kind settled by bringing it to the attention of the house.

Mr. McCready gave his experience. His town has three good Hardware stores, but the lumber dealers buy from jobbers.

Mr. Morgan had also found that contractors who even had not enough capital to get a rating in a commercial agency report were able to purchase from jobbers, and told some peculiar experiences of his own in this connection.

*What makes the best and most satisfactory light for a Hardware store?*

Mr. Scott stated that this was entirely owing to circumstances. Two years ago he had put in a gasoline plant costing him \$70. It lights his store very satisfactorily at a cost of not over 1 cent per hour with gasoline costing 10 cents a gallon, or less using Welsbach mantles.

Mr. Odell said he also has a gasoline plant which costs him 75 cents per month for light, burning gas up to nine and ten o'clock at night, except in winter months, when the shorter days make the cost run up to \$1.50 per month. His machine cost \$60, and he also uses Welsbach mantles.

Mr. Davidson of Cleveland stated that he pays from \$18 to \$35 for electricity and \$4 to \$8 for gas.

Mr. Johnson of Barberton said that he has two store-

rooms. Some years since he had used coal oil in lamps, which had cost 15 to 17 cents a night, and had given great trouble on account of the necessary care required by the lamps. Last November he put in an acetylene plant, under a guarantee that it would not cost over 20 cents a night. He found that it cost 45 cents a night the first month. Some changes were made by the man who installed the plant, and the next month the cost was 15 to 17 cents, but the following month went up to 48 cents. In the meantime the electric company in his town reduced the cost of lighting, and offered him the necessary electric light at 20 cents a night, and he put in electric lamps.

#### Donation to Secretary.

At this point Secretary Baker was called out of the room on some pretext, and Mr. Duffey moved that \$100 in gold be donated to the secretary for his very efficient services in behalf of the association. The motion was carried unanimously.

#### Question Box Resumed.

Proceeding with the discussion of lighting, Mr. White stated that he has a room 25 x 85 feet, had tried coal oil lamps and electric light, but now uses gasoline. It costs but 8 cents per night for ten lights, and the light all over the store is so brilliant that colors can easily be distinguished.

*Is it policy to cut prices on staple articles to meet competition from bankrupt stores?*

This question met with an instant response in the negative from a score of throats.

*How can a retailer keep his stock free from dead stock?*

Mr. Cole said that he put his dead stock once a year in a job lot pile, adding some good stock to make it attractive. The clerks are instructed to call attention to such job lots whenever a customer comes in, and in this way the stock is worked off.

Mr. Spoerle of Hamilton said that he carries a stock of \$15,000 and has not \$200 dead stock in the house. If he finds he has made a mistake in buying, which sometimes happens, he as quickly as possible pushes the goods out. This does not necessarily mean that he makes a cut price, but he keeps the goods in sight so that they will be sure to be sold.

Mr. Winter believed that no one needed to have dead stock. He thought stock of this kind was more likely to be secured when buying novelties or new patented articles. He therefore took good care not to buy new things until they had been tested and shown to have some popular points. He carries a stock of \$17,000 and has very little dead stock. He throws out anything which does not sell. If the proprietor gives his personal attention to the condition of the stock he can keep it down. One must not keep invoicing dead stock from year to year, but it should be thrown out quickly.

Mr. White said that if a dealer keeps pushing things and endeavoring to sell them he will not have dead stock.

Mr. Cole asked how the dealers present got rid of old style builders' Hardware?

Mr. Spoerle said that this should be pushed out along with other things.

Mr. Stone had bought a store in which he found a considerable quantity of dead stock, but made it a point to get rid of it quickly at some price. He did not think that in his stock of \$12,000 over \$100 of bad stock could be found.

*What ideas have you on a plan for mutual insurance?*

This question evidently failed to bring out the discussion expected by the person who propounded it. The comparisons made by those who discussed it were simply between stock and mutual insurance companies. Mr. Morgan, however, stated that every Hardwareman should be sure to take an inventory at least once a year as without a recent inventory in case of fire he would find more or less trouble in settling with insurance com-



panies. He had recently had some experience in this line, and fortunately had completed an inventory of his stock only a few weeks before the fire.

*What is the best way to compete with bargain stores, racket stores and catalogue houses? What should be done with jobbers who sell department stores?*

An adjournment was taken for dinner immediately after the reading of this question.

#### THURSDAY AFTERNOON.

The session was opened with remarks from Mr. Bishop, who extended a cordial invitation from the Cleveland Hardware dealers to the association to make Cleveland the place of holding the next annual convention. He supplemented the invitation with a number of reasons why Cleveland should be so favored.

#### Secretary Baker Eulogized

President Wiseman called up Secretary Baker, and, after some highly appreciative remarks regarding the services rendered by that gentleman to the association, announced to him the action which had been taken in his absence during the morning. Mr. Baker thanked the association for the substantial token of their regard, but he prized more highly than the gift the confidence and esteem which it demonstrated.

The question as to department store competition was then laid before the convention for discussion, but seemed to elicit no interest, the Ohio dealers evidently suffering much less from irregularities of this kind in their trade than their brethren of the Northwest.

*Would it not be a good plan to have a National Retail Hardware Association? What action should this association take in the matter?*

The statement was made that this subject would be considered by the Committee on Resolutions.

*Should jobbers retail and, if so, what protection should they give their retail customers?*

The discussion which followed on this subject dealt with the attitude of the jobbers toward the association. It was stated that the membership of the jobbers was to a great extent complimentary, and much credit was due their traveling men, who had done a great deal toward increasing the membership of the association. It was believed by President Wiseman that no jobber in Ohio had any other object in joining the association than a sympathetic and complimentary purpose.

*Who introduces new articles to consumers, the jobber or the retailer?*

Mr. Scott believed that the jobber was the man who introduced new articles, and said that he usually got such new goods as he carried through his jobber.

*What is the best method of keeping Hardware catalogues?*

Mr. Winter said that he had a cabinet for this purpose and keeps an index. The cabinet is numbered and the catalogues are numbered to correspond. He can put his hand on the catalogue needed in a few moments.

Mr. Bogardus thought a retail Hardwareman needs a bookcase as well as a lawyer does. One needs two indexes, by the name and by the subject.

Mr. Scott said he keeps an invoice book for small price-lists and circulars. He pastes these lists in such a book and keeps an index to correspond.

Mr. Baker said that his system of keeping catalogues had been described in *The Iron Age*, and after its publication he had received 90 or more letters on the subject. He has a bookcase for large catalogues and also has a cabinet with 16 drawers. Small books go into the cabinet, where they are arranged in families or groups. Drawer No. 4, for instance, contains everything pertaining to carpenters' or mechanics' tools. He keeps two indexes, one by name and one by article. In looking into the index under the head of Saws, for instance, he finds that Saw catalogues are in Drawer 4. On looking for the names he finds that Atkins or Disston would

be found in Drawer 4. When he gets a new list or new catalogue he immediately destroys the old one. After his system had been described in *The Iron Age*, among the letters he received was one from an undertaker in Androscoggin, Me. He said that he had seen *The Iron Age* in a local Hardware store and wanted some additional points for his own use in keeping his catalogues. This showed the general desire of all classes of people for a systematic method of keeping documents of this character.

*Should jobbers be admitted to membership in this association?*

Secretary Baker proceeded to outline what he thought was the proper policy to pursue in this matter. He believed that jobbers and retailers should really be united in one body. Jobbers will then be mindful of the interests of the retailers and retailers will have a more friendly feeling for jobbers. When anything happens which seems to be hostile to the interests of the retailers it can be settled more easily and with a great deal less friction.

Messrs. Michael, Burr, Duffey, Davidson and Kanney discussed the question from a very friendly standpoint toward the jobbers. They were referred to as having been of great assistance not only in connection with this association but also in local associations.

*Would it not be a good idea to ask the manufacturers of Bolts to give the Nuts an extra twist so that they will not come off when you retail them?*

This question evoked the merriment which the writer evidently expected to call forth, and thus ended the question box discussion.

#### Routine Business.

The president appointed the following Committee on Nominations of Officers for the ensuing year: Messrs. Guyton of Ada, Harner of Bellefontaine, Reid of Greenville, Haberman of Madden, and Talmage of Mt. Gilead.

Mr. Morris, chairman of the Committee on Resolutions, presented the following, which were adopted without amendment:

#### Resolutions.

*Resolved*, That we reaffirm the sentiments of the resolutions adopted at the meeting held at Columbus in 1898.

*Resolved*, That the necessity of an organization in every town where there are two or more stores be urged upon our members to the end that Hardwaremen may become better acquainted and work more in harmony.

*Resolved*, That it is not expedient for this association at this time to encourage the formation of a national retail Hardware association.

*Resolved*, That we indorse the action taken by the Merchants' Association of New York against the exorbitant charges of the express companies and pledge them our hearty co-operation.

*Resolved*, That in the absence of any lien law for the protection of the Hardware trade we earnestly urge that the Executive Committee be authorized to act in this matter.

*Resolved*, That we recommend that a committee of three be appointed to revise the constitution and by-laws of this association, which are at present inadequate.

The president appointed the following Committee on Revision of the Constitution and By-Laws: Messrs. Ross of Bowling Green, Ingalls of Bryan and Everly of Springfield.

Mr. Scott moved that when it becomes necessary for the Executive Committee to hold a special meeting during the year their expenses for traveling and necessary sustenance should be paid. This was agreed to.

Mr. Gray moved that all grievances shall hereafter be laid before the Grievance Committee and not be brought before the association.

#### Cleveland Selected.

Letters were read from the Hardware dealers of Cleveland inviting the association to meet there next

year; an invitation was read from the Victory Hotel, at Put-in-Bay on Lake Erie, and invitations were verbally given by members to hold the next meeting at Cincinnati and at Columbus. A vote was taken and Cleveland carried the day by an overwhelming majority.

#### Speech by Mr. Jaeger.

At this point a discussion of relations toward jobbers came up, and a notable speech was made by Mr. Jaeger on the cultivation of more friendly relations with them by retailers.

#### Election of Officers.

Mr. Haberman of the Committee on Nominations reported in favor of the re-election of the entire list of officers, with the addition of H. P. Davidson of Cleveland as a member of the Executive Committee. The rules were suspended and the officers were elected by acclamation.

Mr. Wiseman thanked the association for the honor conferred on him in re-electing him president, and stated that he would devote all the time he could spare for the upbuilding of the association, making it the effort of his life to go to Cleveland with 500 members.

Mr. Baker thanked the association for his re-election as secretary, and begged to make the suggestion that as the association is rapidly growing it would be advisable that some thought should be given this year toward the selection of a man for secretary having some kind of business which would take him over the State, so that he would be able to do a great deal more toward increasing the membership.

Mr. Scott, speaking for the Executive Committee, hoped that the members would write to the committee during the year and make suggestions as to what ought to be done for the purpose of increasing the value of their association.

Mr. Castell moved that each member should pledge himself to bring at least one new member to the next meeting.

Mr. Guyton spoke in glowing terms of the magnificent corps of officers enjoyed by the association. He also alluded with great praise to the work of Mr. Nussbaum, who had alone brought in 24 new members during the year.

On motion of Mr. Haberman resolutions of thanks were extended to Frank Harrison, the Hardware trade of Toledo, the citizens of Toledo, and to the Boody House and St. Charles Hotel for the courtesies distributed to the members.

#### THURSDAY EVENING.

The final entertainment provided by the local Reception Committee was free admission to a performance at the Valentine Theatre, which was enjoyed by no less than 439 guests. Mr. Harrison appeared before the curtain of the theatre previous to the performance and in a graceful speech expressed his pleasure in having the Hardware dealers of Ohio as guests of the citizens of Toledo, and introduced Mr. Gunkel, a prominent citizen, who told a most amazing fish story as a prelude, and then deftly introduced the subject of the Ohio Centennial, which is to be celebrated in Toledo, and asked the support of the Hardware trade in making it a success. The performance was greatly enjoyed, and the members of the association dispersed with the most pleasant memories of the time they had passed in Toledo.

#### CONVENTION NOTES.

Some of the details of the work done by the local Reception Committee, of which Frank Harrison was chairman, should be specifically mentioned. The badges which they prepared for the members were unique, consisting of a large celluloid button, bearing a suitable inscription, surrounding a picture of a frog, this device having a local application. A celluloid streamer of carmine hue was attached to the button, and on it was the outline of a turtle, referring to the play of that name

which the members were to enjoy at the Valentine Theatre on Thursday evening. Within the turtle a number was printed, corresponding with the number opposite the member's name on an identification list. This list was printed in part on the evening of the first day, followed by a supplement on the second day, and proved to be a highly valued feature of the occasion, as the attendance was so heavy that such an aid to acquaintance was desirable. The expenses of these arrangements and the entertainment at the theater were borne by the local Hardware houses and dealers in Oils, Paints and Varnishes, assisted by several concerns in other lines.

A number of manufacturers made displays of samples in the Boody House.

E. C. Atkins & Co. of Indianapolis, represented by W. E. Jackson, exhibited their line of Hand Saws, and gave as a souvenir a pocket steel foot rule, in a leather case.

The Jackson Knife & Shear Company of Fremont, Ohio, were represented by A. V. Baumann, secretary and treasurer, who made a fine display of Pocket Cutlery, Razors, Scissors, &c.

The New York Cutlery Company of Gowanda, N. Y., represented by J. W. Schatt, showed a large line of Pocket Knives.

Alfred Field & Co. of New York, represented by M. T. Ryan, exhibited samples of their line.

A very large number of traveling salesmen, representing a great variety of establishments catering to the Hardware trade, were in attendance and exhibited great interest in the proceedings.

The enthusiasm of the Ohio Hardware dealers was particularly displayed in the case of the men of Akron. All of the seven regular Hardware stores in that city were closed while the proprietors attended the convention. A record of this kind is hard to beat.

W. B. Bogardus of Bogardus & Co., Mt. Vernon, made a capital address on "Ideals" at the banquet. It was full of cheerful philosophy, acquired in a long experience as a merchant, and was also enlivened by humor. Mr. Bogardus believes that his store was the first to have its arrangement illustrated in *The Iron Age*.

Ohio has some Hardware stores with a venerable history. One of these, represented at the convention by W. P. Scott, is that of the Morris Hardware Company at McConnellsville. This store will celebrate its fiftieth year. It has occupied the same location all this time. The building has been remodeled, but part of the original store room is still in use.

#### Among the Hardware Trade.

J. C. Walker has purchased Mr. Coultry's interest in the Furnace, Range and Heater business at Mount Morris, N. Y., and will continue under his own name. He is expecting to add a stock of Shelf Hardware, Paints, Oils, Glass, &c., as well as Agricultural Implements. Bicycle repairing is another line which he is contemplating taking up.

The Amsier Hardware Company have recently embarked in business at Tonica, Ill.

Chas. A. Schrandt has sold out his Hardware business at Gordon, Neb., to Pfeiffer & Co.

Parsons & Westcott, jobbers and retailers of Hardware, Tinware, Sporting Goods, &c., Iowa City, Iowa, dissolved partnership on the 1st ult. Mr. Westcott has retired and the business is now being conducted under the style of Parsons & Stouffer. The new member of the firm has been connected with the house for a number of years.

Watson & Sloan are successors to A. Watson at East Liverpool, Ohio. The stock comprises Hardware, Stoves, Tinware, Paints and Oils, Varnishes, Agricultural Implements, &c.

The Oswego Hardware Company, Oswego, N. Y., have bought F. R. Gerry & Co.'s stock of Doors, Sash, Blinds and Glass, and will carry a large stock of these goods and sell at wholesale and retail.



The establishment of the Gardner-Warner Hardware Company, Minneapolis, Minn., was badly damaged in a recent fire.

J. M. Clark of Onaway, Mich., is now occupying his new building on First street with a full and complete line of Heavy and Shelf Hardware, Builders' Materials, &c.

John S. Erikson has purchased the Richey Hardware Stock at Fowler, Ind.

On or about April 1 C. Morgan's Sons, Hardware merchants, Wilkes-Barre, Pa., will remove from 56 West Market street to 30 South Main street, where they have materially larger facilities. Their main store will be 20½ x 210 feet, with basement the same width by 217½ feet in length. This change is made necessary by the overcrowded condition of their present salesroom and storehouse. The business was established in 1868 as C. Morgan & Son.

The Carlton Hardware Company, Calumet, Mich., have incorporated their business, with a capital stock of \$35,000.

E. R. Davis & Co. have bought out the business of the Vance Hardware Company, Clarksburg, W. Va., and will continue at the old stand.

F. H. Rae, a well-known vessel captain, has purchased the interest of N. Ackermann in the Hardware business of Bailey & Ackermann, Vermilion, Ohio, and the new firm style is Bailey & Rae. They will carry a full line of Hardware, Stoves and Tinware, Bicycles, &c.

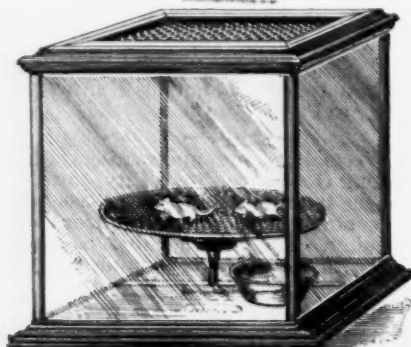
The S. B. Hubbard Company, Jacksonville, Fla., recently sustained a fire loss of about \$12,000, \$10,000 on stock and the remainder on building. They were well insured. The fire damaged the back portion of their main building, which is separated from the front part by a fire wall and fire doors. The burned portion of the establishment has been rebuilt and new stock has been installed. The company advise us that their business since the first of the year has been better than that of any former similar period, and they are adding to their main store premises 25 x 70 feet in dimensions, which will be used entirely for the display and sale of Stoves.

Paxton Hardware Mfg. Company, Paxton, Ill., have purchased the retail Hardware business of Thompson & Keator of that city, and the store will be continued under the name of the company. In addition to their manufacturing and retail business they job a line of Kitchen Hardware, Bicycles and Bicycle Sundries throughout Central Illinois and a portion of Western Indiana. They retail, but do not job, Shelf and Builders' Hardware and Stoves. In their retail store they expect to make something of a specialty of Kitchen Hardware, Bicycles, Cameras, Camera Supplies and Athletic Goods. They have improved the appearance of their stockroom and expect to do more in this direction by putting in shelf boxes, display racks, &c.

The Buchanan Hardware Company are successors to the firm of Buchanan & Co., Richfield Springs, N. Y., and are already making preparations to enlarge their business, having leased the adjoining store, which gives them a capacious establishment.

#### Mouse Circus.

O. Lindemann & Co., 81 Beekman street, New York, are manufacturing the mouse circus here illustrated.



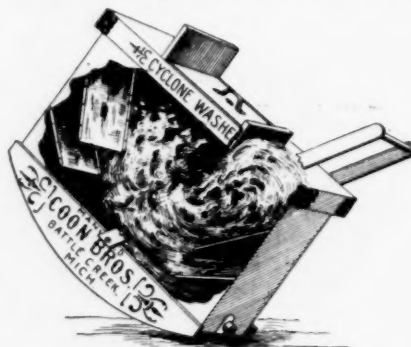
Mouse Circus for Show Window Advertising.

While doubtless a source of amusement to individuals at home or in private, it is designed more particularly for advertising purposes, especially to attract a crowd by dis-

playing it in a store show window. The base is 11 inches square; height, 10 inches. The front and sides are glass, the top and back of wire netting, with a door in the back. The top is removable, so that the wire disk can be put in position on the standard. The tin drawer or bottom is then covered with sawdust and a pair of mice introduced, white or the common species, any kind serving the purpose, although the ordinary wild mice will be more lively. Then, with some water in the cup and cracker or bread in the cage, it is ready for use. The racing mice on the swiftly moving disk are relied on to attract a throng. Each circus is packed in a wooden box and is offered at a comparatively low price.

#### The Cyclone Washer.

An illustration is herewith given of the washing machine now being placed on the market by the Cyclone Washing Machine Company, Battle Creek, Mich. The



The Cyclone Washer.

illustration shows the body of the machine partly broken away to explain the method of operation. It has a curved bottom, which rests directly on the floor, and is operated by rocking. It contains no rubbing apparatus, but the washing is accomplished by the reaction of compressed air in the air chambers, which forces the hot soap suds through the texture of the fabrics being washed. This is accomplished by the alternate filling and emptying of the air chambers in the ends of the machine with first air and then water, which flows in and expels the air, and which takes place as the water flows back and forth from end to end with each motion of the machine on its rockers. Thus the dirt is removed from the clothing with the least possible amount of friction, and consequently 'of wear. The machine is stated to be equally adapted to washing either the heaviest carpets or the finest laces. It is made of galvanized iron, supported by a wood frame, thus avoiding the shrinking and leaking so often encountered in a wooden machine.

#### Imperial Padlock.

The Slaymaker-Barry Company, Connellsville, Pa., John H. Graham & Co., 113 Chambers street, New York, general sales agents, are making the Imperial lock No. 75,



Imperial Padlock No. 75.

here illustrated. It has a polished and nicked iron case, cap and shackle, the locking mechanism is bronze metal, the spring shackle is self locking, and there is a key cylinder of brass. The action is referred to as that of six-lever locks. There are two flat steel keys to each lock and the goods are put up in boxes of six, 50 dozen in a case.

### The Round Western Washer.

The Michigan Washing Machine Company, Muskegon, Mich., manufacturers of the Michigan and the Square Western washers, have brought out the Round Western, which is herewith illustrated. A portion of the body has been cut away to show the method of construction. The manufacturers describe this machine as follows: The castings are strong, accurately machined and fitted, so that an exceptionally easy running machine is the result. The post and dasher are made from the best hard maple, and

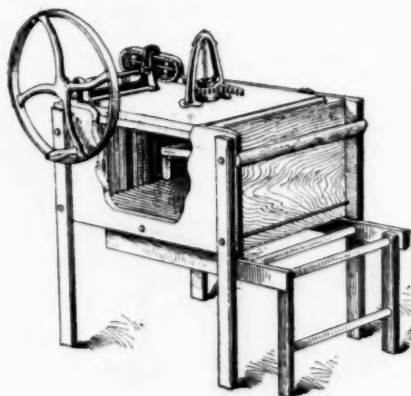


*The Round Western Washer.*

finished with a preserving mixture, which fills all the pores of the wood, thus preventing the hot water from penetrating the same, with the result that they positively will not check, warp or rot. The body is made from thoroughly seasoned kiln dried yellow cottonwood, bolted securely together with six bolts, which are all on the outside of the machine. There being no iron in the interior that will rust, consequently there is absolutely no danger of rust spots on the clothes. The interior of the sides, ends and bottom is corrugated; the corners filled in with three-cornered corrugated pieces. Thus a uniform corrugation is secured all around, making a far better rubbing surface than where upright rounds are used in the ends, the space thereby gained making more room for clothes instead of hot water wasted. In this washer there are no places for pieces to get lost in or become fastened.

### Benbow Rotary Washer.

Benbow Mfg. Company, 1017 North Thirteenth street, St. Louis, Mo., are making the Benbow rotary washer, here shown. It is stated that the internal vibrating gear



*Benbow Rotary Washer, Square Pattern.*

with rider guide and stationary propelling pinion with the balance wheel form a powerful reverse movement, so that an operator can sit in a chair and run the machine forward or backward easily. The mechanism always being in gear has, it is said, little friction and is very

durable. This movement can be placed on the round or square machines. A heavy malleable pin head, shaft and spring similar to the kind in the Columbia washer are used. They also make a double machine, or one with two compartments, so that the clothes can be washed through the first and second suds at the same time by using an extra rack bar and a heavier balance wheel. The momentum gained by the balance wheel on the gradual reverse at each end of internal gear will, it is said, carry it from one reverse to the other, making the double machine as easy to operate as the single style. Other features to which the manufacturers call attention are that there are no clutches, springs or triggers to break or get out of adjustment; that the machine is always in gear; that there is no sudden jar in reversing and it will run forward or backward; that the balance wheel being in the rear and out of the way does not necessitate lifting the entire weight in opening the washer. The machine is guaranteed in every respect for two years.

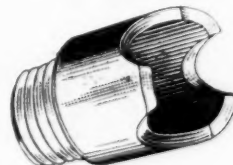
### Kinnear Ice Calk.

The Kinnear Calk Company, Columbus, Ohio, manufacturers of calks for horseshoes, are introducing the



*Fig. 1.—Kinnear Horseshoe Calk and Wrench.*

Kinnear ice calk, here illustrated. The calk most generally used is shown in Fig. 1 both on the shoe and detached, together with the necessary tool for attaching either kind



*Fig. 2.—Ice Calk Detached.*

of calk. Fig. 2 is a view of the ice calk, which is made for effectiveness in extremely slippery weather, where icy roads prevail. Sample calks will be sent on application.

James E. Pickrell & Co., who last fall succeeded the Columbia Hardware Company at Northport, Wash., have lately moved into their own new building. The storeroom is 24 x 60 feet in dimensions, with basement of the same size. They are expecting to enlarge their stock, which now comprises Shelf and Heavy Hardware, Miners' Supplies, Tinware, Crockery, Paints, Oils, &c., as soon as they are completely settled.



### Graining Paper.

H. J. Brainerd & Co., 107 Chambers street, New York, are the sole selling agents in the United States of the Maserir-Loschpapier, or graining paper, illustrated in the accompanying engravings. This method of graining does not transfer, it absorbs the surplus material much in effect as an individual does in hand graining



Fig. 1.—Graining with Maserir-Loschpapier.

with rag or other material. The surface to be grained is painted in oil color, as customary, and when ready to be treated, is covered with a sap color or appropriate graining stain in water or oil, put on with a brush. The paper, which has first been cut into the proper shape to fit panels or other parts, is then with a joinable graining brush forced evenly against the wet surface, when all is removed, save that which is opposite the markings on the paper, which is an exact photographic reproduction from a fine example of the original wood. The markings are chemically prepared and thoroughly non-absorbent, while the remainder of the paper absorbs readily. After the surface has thoroughly dried it is



Fig. 2.—Walnut Graining.

varnished, thus bringing out the grain and holding it permanently. At present the paper, which is put up in rolls four yards long and 26 inches wide, can be furnished in six styles of oak, four styles of walnut and one each of rosewood, maple, German and Hungarian ash, mahogany and marble, only the finest specimens being reproduced. The paper can be used fifty times on water color, with care, but twenty-five times will give much better results, while on oil color the paper can be used fewer times. This process gives results true to nature while saving the expense of skilled labor, and for upper floors in residences, &c., inexpensive woods can be used, instead of hard woods. Arrangements have been made with a prominent paint concern so that all

the necessary materials such as paint, colors, varnish, brushes, &c., can be sent complete with the paper. This commodity seems peculiarly adapted for the Hardware

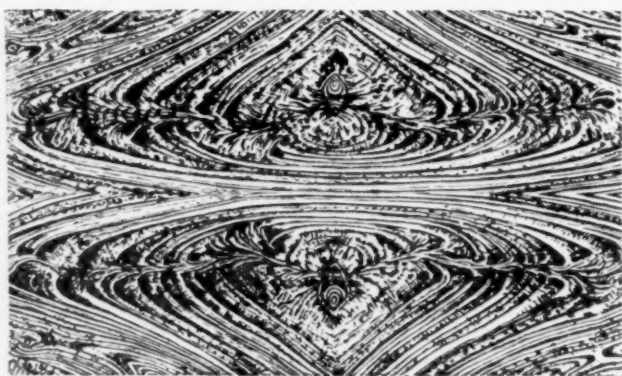


Fig. 3.—Mahogany Graining.

trade, who so generally deal in paints, Oils, &c. Fig. 1 shows the method of using the paper, and Figs. 2 and 3 give specimens of walnut and mahogany graining.

### Hendee Wire Brooms.

Illustrations are herewith presented of new wire brooms which have been brought out by the Hendee Wire Brush Company, 342 to 346 Broadway, Milwaukee, Wis. The track broom, Fig. 1, is intended for steam and street railway track sweeping, and is made of extra



Fig. 1.—Track Broom.

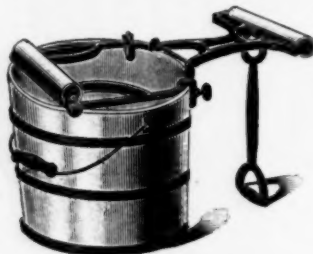


Fig. 2.—Switch Broom.

heavy flat steel wire. The switch broom, Fig. 2, is designed for cleaning from street railway curves ice, snow and dirt. It has a handle 38 inches long with a steel scraper on the end. The handle is riveted to the brush. This broom is strongly made of extra heavy wire set in V shape.

### Joyner's Mop Wringer.

An illustration is herewith given of a new mop wringer manufactured by the Anderson Pole & Shaft Company, Anderson, Ind. The wringer is shown attached to a bucket. It is explained that it is easily adjusted to either a wood or metal pail, that it can be oper-



Joyner's Mop Wringer.

ated by foot or hand pressure, that it has no spring to rust, and that it is strongly made of malleable iron. In operation, when the rollers are brought together the handle, which in the illustration rests on the floor, will

then be in an upright position. By holding the handle with one hand and pulling the mop between the rollers with the other hand the operator is enabled to effectually force the dirt and water out of the mop. The manufacturers claim that by any twisting process the water is simply wrung out of the mop, leaving the dirt in the center; but with this device all the dirt and water are forced out of the mop.

#### The Milwaukee Corn Husker.

The Milwaukee Hay Tool Company, Milwaukee, Wis., are manufacturing machines to husk corn and shred fodder by power. The machines are named the Milwaukee Corn Husker, and are made in several sizes. One size has two rollers, another four rollers, another six rollers and another eight rollers. These machines snap the ears of corn from the stalk, crush and cut up or shred the stalk for fodder, and husk the ears, all in one operation. It is claimed that they husk the smallest nubbins as well as the largest ear of corn. The eight roller machine has a capacity which will meet the wants of threshermen. The two roller machine was brought out the



Milwaukee Corn Husker.

past season to supply the demand for a small-sized machine, and can be run with four or six horse-power, or with a small engine. The company also manufacture a blower attachment in connection with any one of these machines, which is an entirely new device. This blower attachment has a pipe extending from it through which the shredded fodder can be blown into the mow of a barn, thus avoiding the necessity of using a separate carrier for elevating the fodder. The accompanying illustration shows the machine with blower.

#### Arc Light Acetylene Gas Lamp.

C. B. Barker & Co., 70-74 West Houston street, New York, have the exclusive sales agency for the Arc Light acetylene gas lamp for bicycle and carriage use, made by the Miller Company, Torrington, Conn., and here illustrated. It is made of brass in extra nickel finish, is strong, durable and light, with a lighting capacity of about four hours, using ordinary commercial carbide. The water reservoir above is filled through a permanent funnel shaped top, protected by a screw cap, the flow of water being regulated by an indicator on the water valve, which is graduated into 24 spaces and is operated in conjunction with six numerals on a dial designed to facilitate gauging the water supply. No absorbent or wick is used, all carbide can be consumed, joints are made with common screw thread and gas joints are sealed with rubber gaskets. A

large polished lens is used in connection with two reflectors, so arranged that the fish-tail flame from a lava two-hole burner is at once projected about 200 feet ahead and

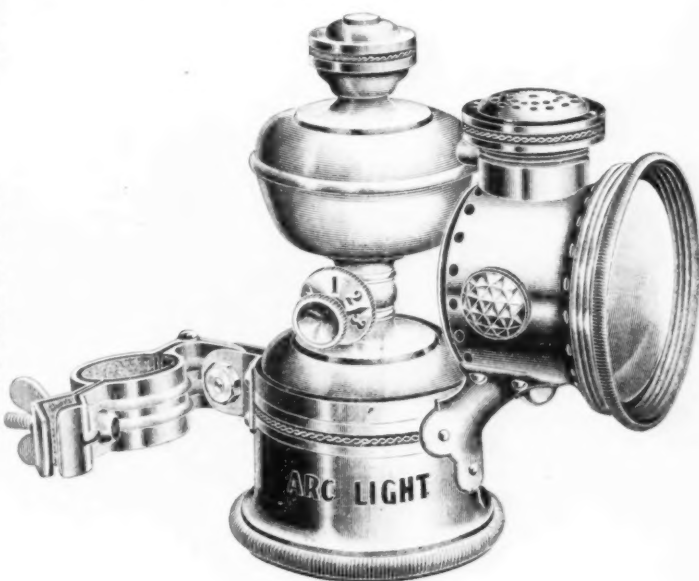


Fig. 1. - Arc Light Acetylene Gas Lamp.

directly in front and under the wheel. It is stated that the lamp is well ventilated, valves and gas ways are straight for easy cleansing, and there are no angles or

curves in the ducts for water and gas. The carbide container of sheet metal is marked with four rings, the spaces between indicating an hour's burning capacity. The

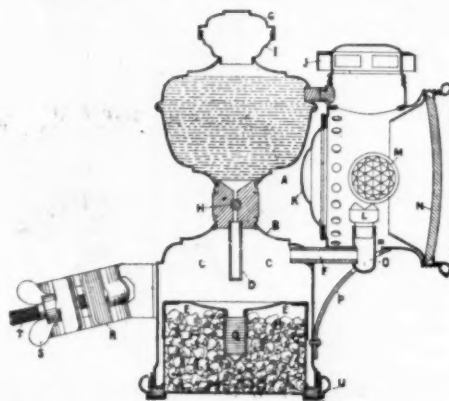


Fig. 2.—Sectional View, Showing Construction.

bracket permits of the lamp being carried on either of the forks or on the head, whether or not there is an outside plunger brake.



### Long Beam Acetylene Lamp.

Long Beam Lamp Company, Hillsboro, Ohio, are the manufacturers of the Long Beam bicycle lamp, using acetylene gas, here illustrated. Fig. 2 is a sectional view, to which the list of parts herewith refers: 1, Curved glass;

2, wire ring for retaining lens; 3, silver plated reflector;

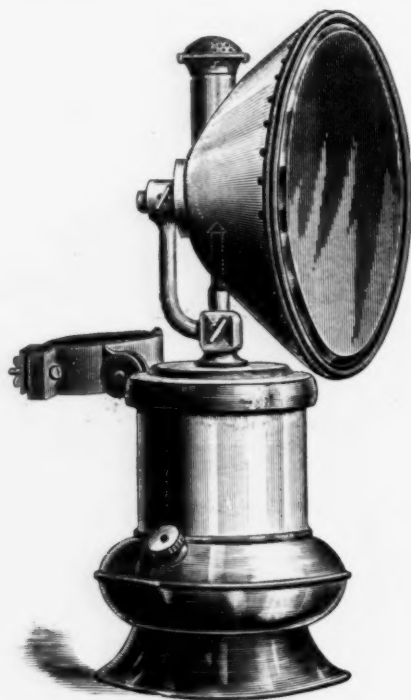


Fig. 1.—Long Beam Acetylene Gas Lamp.

4 burner tips; 5, reflector support and focusing arm; 6, top thumb screw; 7, bottom thumb screw; 8, screw cap; 9, carbide can; 10, spring and diaphragm attached; 11, wick; 12, water can; 13, water filler cap; 14, water tube and wick holder; 15, nut to hold water can in place; 16, water valve; 17, rubber washer to make tight joint; 18, adjustable bracket; 19, bracket adjusting screw; 20,

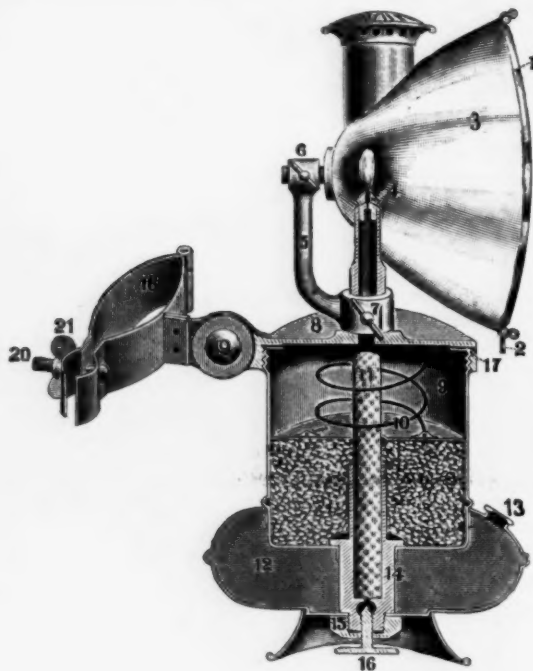


Fig. 2.—Sectional View of Parts.

bracket clamp screw; 21, wing nut. Some of the characteristics referred to by the makers are that the lowest level of carbide is above the highest level of water, and contact with the carbide is made by a small wick chemically prepared, which allows the water to rise by capillary attraction, thus insuring a steady light; should wick be removed, lamp charged with carbide and water and valve wide open there would be no action of the carbide and no

gas, by which it is understood the generation of gas is always under control by means of the valve, No. 16. It is stated that three varieties of light are projected, one that can be seen 300 feet in front by the rider, another striking the ground immediately in front of the wheel and spreading out to a width of about 6 feet, lighting the road for 75 feet, and still another that illuminates the road in a more general and less specific way. The candle power obtained by photometric test is said to be as follows: Beam, 480 candle power; oval light, 100 candle power, and open and radiated light, 10 candle power.

### The Simplex Automatic Gas Lamp.

The Hine-Watt Mfg. Company, 14 and 16 North Canal street, Chicago, have brought out the new acetylene gas bicycle lamp which is illustrated in Fig. 1. Its weight is 14 ounces, height 5½ inches, and diameter of reflector 3 inches. The description of this lamp which is furnished

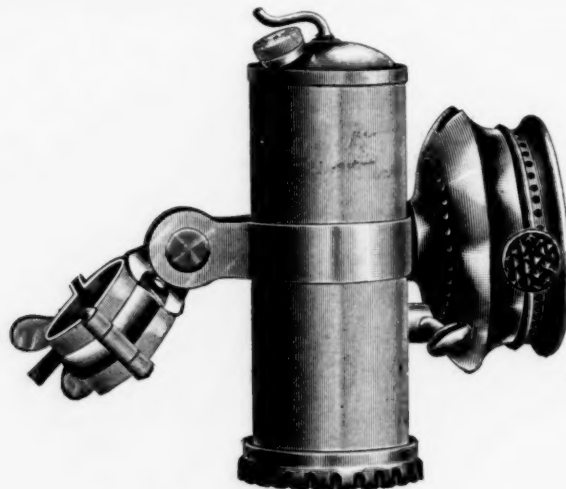


Fig. 1.—The Simplex Automatic Gas Lamp.

by the manufacturers makes a number of interesting statements, which are briefly as follows: The patent burner requires no cleaning; the flame can be turned high or low and burned all night or turned off and relit the next evening; the lamp will burn upside down without being disturbed; the water feed is self regulating and the water valve requires no attention. The lamp uses lamp carbide in any form. The lettering in the sectional view, Fig. 2, is explained as follows: W P—Water Plug;

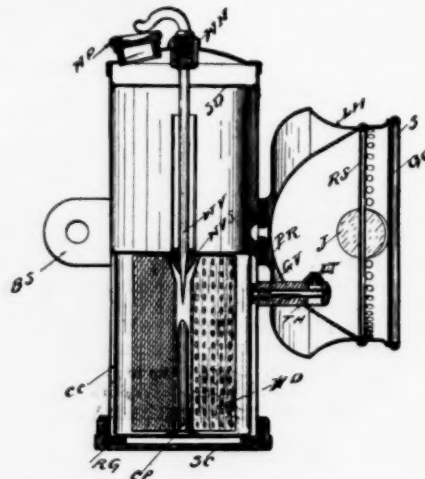


Fig. 2.—Sectional View of Gas Lamp.

W N—Water Valve Nut; W V—Water Valve; W V S—Water Valve Seat; C P—Centering Pin; W D—Water Distributer; R G—Rubber Gasket; S C—Screw Cap; B S—Bracket Strap; C C—Carbide Cup; T H—Tip Holder; P R—Parabolic Reflector; G V—Gas Valve; S D—Splash Diaphragm; J—Jewel; L T—Patent Lava Tips; L H—Light Head. This lamp is intended to be retailed at \$2.50.

L. E. Horton & Co., Wahpeton, N. Dak., have bought Schuler Bros.' Hardware and Implement warehouse and stock, and will continue the business on the same lines as in the past.

# Current Hardware Prices.

MARCH 1, 1899.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices, while lower prices are often given to larger buyers.

The character @ is used to indicate a range of price; thus discount 50 & 10 @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 5% to 10% to 50 & 10 & 5%.

Many of the lists referred to in the following quotations are given in *The Iron Age* Standard Hardware Lists (price 50 cents). On many other articles, however, the different manufacturers have their own lists, which they will send to the trade on application. In the advertising columns will be found the announcements of manufacturers of nearly all kinds of Hardware, who will be pleased to furnish the trade information in regard to their goods and prices.

March, 1899. — In the present condition of the market many advances are being announced by manufacturers, but in some cases lower prices are made by the whole-sale trade who have stocks on hand purchased at former quotations.

## Adjusters Blind—

Domestic, 1/2 doz. \$3.00... 33 1/2 @ 33 1/2 @ 10%  
North's... 10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent... 40%  
Taplin's Perfection... 45%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anti-Rattlers—

Burton's No. 1... 1/2 doz. pr., \$1.00  
Burton's No. 2... 1/2 doz. pr., \$0.75  
Fernald's Wire... 1/2 doz. pr., \$0.75

## Anvils—American—

Eagle Anvil, 1/2 D... 7 1/2 @ 7 1/2 @  
Hay-Budden, Wrought... 8 1/2 @ 8 1/2 @  
Horseshoe brand, Wrought... 9 1/2 @ 9 1/2 @  
Samson, 1/2 D... 7 1/2 @ 7 1/2 @  
Trenton, Wrought... 1/2 D @ 8 1/2 @

## Imported—

Armitage's Mouse Hole... 8 1/2 @ 9 1/2 @  
Solid Swedish Steel... 10 @ 10 1/2 @  
Peter Wright's... 10 1/2 @ 10 1/2 @

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00... 20%

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Common Double Spur... 60 @ 90 @ 5%  
Boring Machine Augers... 80 @ 90 @ 5%  
Car Bits, 12-in. twist, 60 @ 10 @ 10 %  
Jennings' Pattern Car Bits... 60 @ 90 @ 10 %  
Jennings' Pattern Auger Bits... 70 @ 10 @ 75 @ 5%

Adams Art Auger Bit... 30%  
Cincinnati Bell Hangers' Bits... 40%  
Forstner Pat. Auger Bits... 25%  
C. E. Jennings & Co... 70 @ 10 @ 75 @ 5%

No. 10 ext. lip. R. Jennings' list... 70 @ 10 @ 75 @ 5%  
No. 30. R. Jennings' list... 50 @ 10 @ 60 @ 5%  
Russell Jennings... 25 @ 10 @ 25 @ 5%  
L'Hommedieu Car Bits 15 @ 10 @ 15 @ 10 %  
Pugh's Black... 20%  
Pugh's Jennings' Pattern... 35%  
Wright's Jennings' Bits (R. Jennings' list)... 50%

## Bit Stock Drills—

Standard list... 60 @ 10 @ 5 @ 60 @ 10 @ 10 %  
Cincinnati, for metal... 50 @ 5 @ 50 @ 10 %  
Syracuse, for wood... 40%  
W. & B. Wood Boring Brace Drills... 40%

## Expansive Bits—

Clark's small, \$18; large, \$28... 50 @ 50 @ 10 %  
Lavigne's Clark's Pattern, No. 1, \$18... 50 @ 50 @ 10 %  
No. 2, \$18... 50 @ 50 @ 10 %  
Steel's No. 1, \$28; No. 2, \$18... 40 @ 40 @ 10 %  
Swan's... 40 @ 40 @ 10 %

## Gimlet Bits—

Common Double Cut... 1/2 gr. \$2.75 @ 3.25  
German Pattern... 1/2 gr. \$2.50 @ 3.00  
Double Cut, makers' lists... 50 @ 50 @ 10 %  
See also Gimlets.

## Hollow Augers—

Bonney's Adjustable, 1/2 doz... \$16.00  
Cincinnati Adjustable... 25 @ 10 %  
Cincinnati Standard... 25 @ 10 %  
Douglas's... 33 1/2 @ 33 1/2 @ 10 %  
Stearns', Common, No. 6... 10%  
"arms", all other numbers... 20 @ 10 %

## Ship Augers and Bits—

L'Hommedieu's... 15 @ 10 @ 15 @ 10 %  
Watrous... 40 @ 40 @ 10 %

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls:  
Handled... 1/2 gr. \$9.00 @ 9.35  
Unhandled, Shouldered... 1/2 gr. 60 @ 70 @  
Unhandled, Patent... 1/2 gr. 70 @ 70 @  
Peg Awls:  
Unhandled, Patent... 1/2 gr. 38 @ 35 @  
Unhandled, Shouldered... 1/2 gr. 65 @ 70 @  
Scratch Awls:  
Handled, Common... 1/2 gr. \$1.25 @ 1.35  
Handled, Socket... 1/2 gr. \$1.03 @ 1.20

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First quality, best brands... \$5.00 @ 5.25  
First quality, other brands... \$4.25 @ 4.75  
Jobbers' Special Brands, good quality... \$4.00 @ 4.75  
Cheap Handled Axes... \$4.75 @ 5.25  
Beveled, add 25¢ per doz.

## Axe Grease—See Grease, Axe.

## Axles—

Concord, loose collar... 4 1/2 @ 4 1/2 @  
Concord, solid collar... 5 @ 5 @  
No. 1 Common... 3 1/2 @ 3 1/2 @  
No. 1 1/2 Com., New Style... 4 @ 3 1/2 @  
No. 2 Solid Collar... 4 1/2 @ 4 1/2 @  
Nos. 1 1/2 to 1 1/4... 60 @ 10 @ 5%  
Nos. 1 1/4 to 1 1/2... 50 @  
Nos. 1 1/2 to 2 1/2... 70%

## Balances—

Caldwell low list... 30%

## Van derbilt... 30%

## Spring—

Spring Balances... 50 @ 10 @ 60 %  
No. 2000 20 30  
Chatillon, 1/2 doz... \$0.60 .70 1.50  
Chatillon Straight Balances... 50%  
Chatillon Circular Balances... 60%

## Barb Wire—See Wire, Barb.

## Bars—

Steel Crowbars, 10 to 40 lb. 1/2 @ 2 1/2 @ 2 1/2 @

## Beams, Scale—

Scale Beams, List Jan. 12, '82... 50 @ 10 %  
Chatillon's No. 1... 40%  
Chatillon's No. 2... 50 @ 10 @ 50 @ 10 %

## Beaters—Egg—

New Dover (Dover Stamping Co.)... 1/2 doz. 75¢ 1/2 gr. \$7.50  
Dover, Ex. Family size... 1/2 doz. \$2.00  
New Dover... 1/2 doz. 75¢ 1/2 gr. \$7.50  
Dover (Standard Co.) No. 10, 1/2 gr... \$5.50; No. 5, \$6.00; No. 15, \$12.00  
Dover (Tap in Pat. Imp.) No. 100, 1/2 gr... \$7.00; No. 150, 1/2 doz. \$2.00  
Lebanon... 1/2 doz. \$2.75 @ \$3.00  
Spiral... 1/2 gr. \$4.25 @ \$4.50  
Wonder (S. S. & Co.)... 1/2 doz. 75¢

## Bellows—

Standard list... 70 @ 10 @ 70 @ 10 %  
Often sold at net prices:  
Inch... 30 32 34 36 38 40  
Each... \$3.75 4.00 4.75 5.25 6.00 7.00  
Extra Length:  
Each... \$4.50 5.00 5.50 6.25 7.00 8.50

## Molders—

Inch... 9 10 11 12 14 16  
Per doz. \$0.90 1.00 1.50 7.75 8.75 11.00 13.25

## Hand—

Inch... 6 7 8 9 10 12  
Per doz... \$3.25 3.50 3.75 4.50 5.25 6.00

## Bells—Cow—

Wrought, Sheep and Cow... 60 @ 10 @ 70 %  
Kentucky... 75 @ 10 %  
Western... 70%  
Jersey... 75 @ 10 %  
Texas Star... 50 @ 10 %

## Door—

Gong, Yankee... 60 @ 10 %  
Lever, R. & E. Mfg. Co.'s... 60 @ 10 %  
Lever and Pull, Sargent's... 45 @ 10 @ 45 @ 10 %

## Hand—

Hand Bells, Polished... 70 @ 10 @ 70 @ 10 %  
White Metal... 70 @ 70 @ 10 %  
Nickel Plated... 60 @ 60 @ 5%  
Swiss... 70%  
Silver Chime... 40 @ 10 @ 50 %

## Miscellaneous—

Farm Bells... 1/2 D 2¢  
Steel Alloy Church and School... 50 @ 10 %

## Belting

Common Standard... 75 @ 10 @ 75 @ 10 %  
Extra... 70 @ 70 @ 10 %  
Standard... 70 @ 10 @ 75 %

## Leather—

Best Oak Tanned... 60 @ 10 @ 60 @ 10 %

## Bench Stops—See Stops, Bench.

## Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15... 50%  
Green River Tire Benders and Upsetters... 20%  
Stoddard's Lightning Tire Upsetters... 40 @ 50 %

## Bicycle Goods—

Lane's Cycle Hanger... 33 1/2 @ 5%  
J. N. S. L. & Son's 1899 list:  
Ball... 50%  
Cha. R. & E. Mfg. Co.'s... 50%  
Par. S... 50%  
Spokes... 50 @ 10 %

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—  
See Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Ad-

justers, Blind.

## Blind Fasteners—See Fast-

eners, Blind.

## Blind Staples—See Staples,

Blind.

## Blocks—

Common Jap'd Sheaves... 75 @ 75 @ 5%  
Eddy's All Steel, Common Bushed... 70%  
Eddy's All Steel, Bronze Bushed... 60 @ 5%  
Hartz All Steel, Common Bushed... 50 @ 10 %  
Hartz All Steel, Bronze Bushed... 50 @ 10 %  
Ford's Star Brand, Self Lubricating... 70%  
Hollow Steel, Ford's Pat. Star Brand... 50 @ 10 %

## Boards Stove—

Market somewhat irregular.  
Manufacturers quote... 30 @ 10 @ 40 %  
Jobbers often sell... 40 @ 10 @ 50 %

## Bolts—

## Carriage, Machine, &c.—

Common, list Jan. 30, '95... 75 @ 10 @ 80 %  
Norway Iron, \$3.00, list Oct. 7, '84... 75 @ 10 @ 75 @ 10 %

Phila. Eagle, \$3.00 list... 75 @ 10 @ 75 @ 10 %  
Bolt Ends, list Jan. 30, '95... 80 @ 80 @ 5%  
Machine list June 12, '96... 80 @ 80 @ 5%

## Door and Shutter—

Cast Iron Barrel, Round Brass Knob:  
Inch... 3 4 5 6 8  
Per doz... \$0.47 .30 .38 .48 .66

Cast Iron Bottom, Japanned:  
Inch... 6 8 10  
Per doz... \$0.83 1.05 1.65

Cast Iron Chisel, Flat, Japanned:  
Inch... 6 8 10  
Per doz... \$1.10 1.30 1.87

Cast Iron Shutter, Brass Knobs:  
Inch... 6 8 10  
Per doz... \$0.49 .77 .88

Wrought Barrel Brass Knob:  
Inch... 3 4 5 6 8  
Per doz... \$0.44 .50 .61 .70 1.28

Ives' Patent Door, 60 @ 10 @ 5 @ 60 @ 10 @ 10 %  
Wrought Flush—  
B. K., Sargent's list... 50 @ 10 @ 60 %  
B. K., Stanley's list... 60 @ 10 @ 60 @ 10 %  
Sunk, Sargent's or Stanley's list... 50 @ 10 @ 50 @ 10 %

Wrought Shutter, Standard list... 60 @ 10 @ 7 @ 60 @ 10 @ 7 %  
Wrought Square, Standard list... 75 @ 75 @ 10 %

## Stove and Plow—

Plow... 70 @ 70 @ 10 %  
Stove, list August 27, 1898... 70 @ 10 %

## Tire—

Common, list Feb. 28, '83... 70 @ 10 @ 7 %  
American Screw Company:  
Norway Phila., list Oct. 16, '84... 75 @ 10 %  
Eagle Phila., list Oct. 16, '84... 80 @ 10 %  
Hay State, list Feb. 28, '83... 70 @ 10 %  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '84... 75 @ 10 %  
Eagle Phila., list Oct. 16, '84... 80 @ 10 %  
Eclipse, list Feb. 28, '83... 70 @ 10 %  
Port Chester Bolt & Nut Company:  
Empire, list Feb. 28, '83... 7 @ 10 %  
Keystone Phila., list Oct. '84... 80 @ 10 %  
Norway Phila., list Oct. '84... 75 @ 10 %

## Borers, Tap—

Borer, Tap, King, with Handle:  
Inch... 1 1 1/2 1 3/4 2  
Per doz... \$3.75 4.75 5.25 6.75

Per doz... \$3.75 4.75 5.25 6.75  
Per doz... \$8.00 11.00  
Enterprise Mfg. Co... 25 @ 30 %  
No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.

## Boring Machines—See Ma-

chines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Letter—

Tatum's... 50%

## Braces—

NOTE.—Most Braces are sold at net prices.  
Barber's... 60 @ 60 @ 10 %  
Common Ball, American... \$1.10 @ 1.20  
Fray's Genuine Spofford's... 50 @ 10 @ 5%  
Fray's No. 70 to 120, \$1 to 120, 20¢ to 41¢... 50 @ 10 @ 5%  
P. S. & W. Co., Peck's Patent... 60 @ 10 @ 5 @ 60 @ 10 @ 10 %

## Brackets—

Shelf, plain; Regular, list... 75 @ 75 @ 10 %  
Stowell's Shelf... 70 @ 5%  
Bradley Shelf Brackets... 80 @ 10 %

## Bright Wire Goods—See Wire.

## Broilers—

Wire Goods Co... 75 @ 75 @ 10 %

## Buckets, Well and Fire—

See Pails.

## Bucks, Saw—

Hoosier... 1/2 gr. \$32.00 @ \$24.00

## Bull Rings—See Rings, Bull.

## Butts Brass—

Cast Brass, Tiebout's... 50 @ 40 @ 10 %  
Wrought Brass, list Sept. '96... 40 @ 40 @ 10 %

## Cast Iron—

Fast Joint, Broad... 60 @ 60 @ 10 %  
Fast Joint, Narrow... 60 @ 10 @ 60 @ 10 @ 10 %  
Loose Joint... 75 @ 10 %  
Loose Pin... 75 @ 10 %  
Parliament Butts... 75 @ 10 %

## Wrought Steel—

Loose Joint... List Apr. 1, 1895 75 @ 10 %  
Table and Back Flaps... 1895 75 @ 10 %  
Narrow and Broad... 1895 75 @ 10 %  
Inside Blind... 75 @ 10 @ 10 %  
Loose Pin... 75 @ 10 %  
Loose Pin, Ball and Steep... 80 @ 5 @ 80 @ 10 @ 5%

## Cages, Bird—

Hendryx, Brass:  
3000, 5000, 1100 series... 10%  
1200 series... 40%  
200, 300, 500 and 900 series... 40 @ 10 @ 50 %  
Hendryx Bronze:  
700, 800 series... 40 @ 10 @ 50 %  
Hendryx Enamelled... 40 @ 10 @ 50 %

## Calipers—See Compasses.

## Chalks, Toe—

Burke's, One Prong, Blunt... 40 @ 41 %

## Burke's, One Prong, Sharp... 50 @ 51 %

Burke's, Two Prong, Blunt... 50 @ 51 %  
Burke's, Two Prong, Sharp... 60 @ 51 %  
Gautier, One Prong, Blunt... 50 @ 51 %

## Can Openers—See Openers, Can.

## Cans, Milk—

Buffalo Pattern:  
Concave Cover... 5 8 10 gal.  
Convex Cover... 1.25 2.00 2.20  
Illinois Pattern... 1.40 2.15 2.35  
Iowa Pattern... 1.80 2.00  
New York Pattern... 1.75 1.95  
Baltimore Pattern... 2.25 2.45  
Chicago S. Co. Seamless Neck... 2.35 2.55

Iowa... \$1.30 \$1.50 \$1.65 each  
Sturges... 1.30 1.50 1.65 each  
Elgin... 1.75 1.90 each  
Chicago... 1.50 1.70 2.00 each

## Cans, Oil—

Galvanized Blue Band, 1-gal., 1/2 doz... \$1.80  
S. S. & Co., Galvanized Family with faucet, 3-gal., 1/2 gr. \$54; 5-gal., \$60, 10-gal., \$180.00  
Glass Oil... 1/2 doz. \$1.80 @ \$1.85

## Caps—Percussion—

Eley's E. B... 50¢  
G. D... \$ M. 32 @ 34¢  
F. L... \$ M. 37 @ 40¢  
G. W... \$ M. 47 @ 50¢  
Musket... \$ M. 47 @ 50¢

## Primers—

Bendall Primers, \$1.00... 2¢  
B. L. Caps (Sturtevant Shells) \$1.00... 2¢  
All other primers... \$1.00 @ \$1.10

## Carpet Stretchers—

See Stretchers, Carpets.

## Cartridges—

NOTE.—These prices are sometimes shaded by jobbers.  
B. B. Caps, Con. Ball Swgd... \$1.00  
B. B. Caps, Round Ball... \$1.12 @ 1.18  
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.  
Blank Cartridges, 22 cal. \$1.75... 2¢  
Blank Cartridges, 32 cal. \$3.50... 2¢  
Cent. Fire, Military and Sporting 15 @ 5 @ 2¢  
Cent. Fire, Pistol and Rifle... 25 @ 5 @ 2¢  
Primed Shells and Bullets... 15 @ 5 @ 2¢  
Rim Fire Cartridges... 50 @ 5 @ 2¢  
Rim Fire, Military... 15 @ 5 @ 2¢

## Carpet Sweepers—

See Sweepers, Carpet.

## Casters—

Bed Plate, etc... 50 @ 70 @ 5%  
Martin's Patent (Phoenix)... 60 @ 60 @ 5%  
Payson's Anti-Friction Furniture... 70 @ 40 @ 5%

Payson's Anti-Friction Truck... 60 @ 10 @ 5%  
Standard Ball Bearing... 50¢  
Tatum's Anti-Friction... 60 @ 60 @ 10 %  
Tucker's Patent, low list... 50 @ 50 @ 5%</



**Tanged and Miscellaneous.**

Buck Bros.	30%
Charles Buck	30%
Tanged Firrs	40% 10 30%
L. & J. J. White, Tanged	25%
Cold Chisels, good quality	14 16%
Cold Chisels, fair quality	12 14%
Cold Chisels, ordinary	7 7 1/2%

**Chucks—**

Beach Pat., each \$8.00	20%
Graham Patent	33 1/2%
Morse's Adjustable, each \$7.00	25%
Syracuse, Balz Pat.	30%
Skinner Patent Chuck	30%
Combination Lathe Chucks	40%
Drill Chucks	30%
Independent Lathe Chucks	40%
Improved Planer Chucks	20%
Universal Lathe Chucks	40%
Union Mfg. Co.	40%
Combination	40%
Czar Drill	30%
Geared Scroll	33 1/2%
Independent	40%
Union Drill	30%
Universal	40%
Face Plate Jaws	35%

**Clamps—**

Adjustable Clin-nut	25 1/2 10%
Adjustable, Hammer	20 20 25%
Adjustable, Stearns	30 30 10%
Cabinet, Sargent's	45 10 50 10%
Carriage Makers', P. S. & W. Co.	40 10%
Carriage Makers', Sargent's	50 10 50 10 50%
Cincinnati Carpenters' & Co.	25 10%
Joiners' Clamps, Tatum's	25 10%
R. L. Tool Co.'s Wrought Iron	25%
Saw Clamps, see <i>Vices, Saw Filers</i>	
Stearns Malleable, with Wrought Iron	75 75 5 5%
Stearns Steel	55 10%
Tatum's Joiners' Adjustable	25 10%
Tatum's Quilt, Cabinet, &c.	40%
Warner's	40 10 10 40 10 5%

**Cleaners, Walk—**

Star Socket, All Steel	doz. \$4.00 net
Star Shank, All Steel	doz. \$3.75 net

**Cleavers, Butchers—**

Foster Bros. Flat Hds., 30%; Rd. Hds., 40%	
New Havea Edge Tool Co.'s	40%
Nichols Bros., Flat hdl., 30%; Rd. hdl., 40%	
Fayette R. Plumb	38 1/2 7 1/2%
P. S. & W.	33 1/2 5 33 1/2 10%
L. & J. J. White	25%

**Clippers—**

Chicago Flexible Shaft Company:	
Handy Toilet	doz. \$7.20
Mascotte Toilet	doz. \$8.40
Monitor Toilet	doz. \$9.00
Stewart's Patent	doz. \$10.00
Hotchkiss Horse Clippers	
No. 10, \$18; No. 30, \$15.60; No. 22, \$13.80; No. 20, \$13.20; No. 8, \$10.80.	
Hotchkiss Toilet Clippers, doz.:	
No. 1, \$9.60; No. 101, \$10.80; No. 201, \$10.80; No. 300, \$18.20; No. 500, \$15.	

**Clips, Axle—**

Eagle and Superior 1/4 and 5/8 Inch	75 75 10%
Norway, 1/4 and 5/8 Inch	70 70 10%

**Cloth and Netting, Wire**—See *Wire, &c.***Cocks, Brass—**

Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.)	70 70 10%
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**Coffee Mills—See *Mills, Coffee.*****Collars, Dog—**

Brass, Pope & Stevens' list	40%
Chapman Mfg. Company, new list	40%
Embossed Gift, Pope & Stevens' list	30 10%
Leather, Pope & Stevens' list	40%

**Combs, Curry—**

Fitch's	25 10%
Hotchkiss', List Nov. 20, '96	25 10%
New York Stamping Co., List Sept. 17 '97	25 10%
New Centaur Spring Curry Comb:	
With Wire Handle	doz. \$1.20
With Strap Handle	doz. \$1.50

**Compasses, Dividers, &c.**

Ordinary Goods	70 10 75%
Bemis & Call Co.'s:	
Dividers	65%
Callipers, Call's Patent Inside	55%
Callipers, Double	70%
Callipers, Inside or Outside	70%
Callipers, Wing	60%
Compasses	50 25%
J. Stevens A. & T. Co.	25 10%

**Coolers, Water—**

S. S. & Co.: 2-gal., \$2.70; 3-gal., \$3.30; 4-gal., \$3.60; 6-gal., \$4.75; 8-gal., \$7.20; 11-gal., \$11; 14-gal., \$14 each 60%	
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**Coopers' Tools—**—See *Tools, Coopers'.***Cord—Sash—**

Braided, Drab and Fancy	doz. 55 1/2 30%
Braided, White	doz. 14 20%
Cable Laid Italian	doz. A, 18; B, 16
Common India	doz. 8 1/2 20%
Cotton Sash Cord	doz. 14 1/2
Patent Russia	doz. 13 1/2 14 1/2
Cable Laid Russia	doz. 13 1/2 14 1/2
India Hemp, Braided	doz. 13 1/2
India Hemp	doz. 10 1/2
Patent India	doz. 10 1/2
Pearl Braided	doz. 14 1/2
Maxwell's	doz. 17 1/2
Eddy-stone Braided Cotton	doz. 18 1/2
Harmony Cable Laid Italian	doz. 18 1/2
Oswan Mills:	
Crown, Solid Braided White	doz. 18 1/2
Braided, Giant, White	doz. 16 1/2
Peerless:	
Cable Laid Italian	doz. 16 1/2
Cable Laid Russian	doz. 15 1/2
Cable Laid India	doz. 15 1/2
Braided India	doz. 15 1/2
Samson:	
Braided, Drab Cotton	doz. 39 35 1/2
Braided, Italian Hemp	doz. 31 33 1/2
Braided, Linn	doz. 55 55 1/2
Braided, White Cotton	doz. 27 30 1/2

**Silver Lake:**

A quality, Drab, 40%	15 7 1/2%
A quality, White, 35%	15 7 1/2%
B quality, Drab, 35%	15 7 1/2%
B quality, White, 30%	15 7 1/2%
Italian Hemp, 40%	15 7 1/2%
Linn, 57 1/2%	15 7 1/2%

**Wire, Picture—**

Braided or Twisted	85 25 5 1/2%
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**Corn Knives and Cutters**—See *Knives, Corn.***Crackers, Nut—**

Acme, Japanned, 1/2 gr. \$30	40%
Acme, Nickel Plated, 1/2 gr. \$30	20%
Turner & Seymour Mfg. Co.	50%

**Cradles—**

Grain	55%
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**Crayons—**

White Round Crayons, gross	5 6 1/2%
Cases, 100 gr., \$4.50 at factory.	
D. M. Steward Mfg. Co.:	
Metal Workers', 1/2 gr. \$2.50	20 25%
Railroad, 1/2 gr. \$2.00	20 25%
Rolling Mill, 1/2 gr. \$2.50	20 25%
Soapstone Pencils, 1/2 gr. \$1.50	20 25%
See also <i>Chalk.</i>	

**Creamery Pails—See *Pails.*****Creamery.****Crooks, Shepherds—**

Fort Madison, Heavy	doz. \$7.00
Fort Madison, Light	doz. \$6.50

**Crow Bars—See *Bars, Crow.*****Cultivators—**

Victor Garden	doz. \$10.00
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**Curry Combs—**—See *Combs, Curry.***Cutters—Meat—**

Cutters—		Meat—		
American				80%
Nos.	1	2	3	4
Each	\$5	\$7	\$10	\$25
Connecticut	No. 0, \$2.00;	No. 1, \$2.50;	No. 8, \$3.00;	No. 12, \$3.50
Enterprise	25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100			
Nos.	5	10	12	29
Each	\$2	\$3	\$2.50	\$4
Dixon's, 1/2 doz.	33 1/2%			
Nos.				3
Each	\$14.00	\$17.00	\$19.00	\$30.00
Hale's, 1/2 doz.	70% 70 1/2 5%			
Nos.	11	12	13	13
Each	\$27.00	\$33.00	\$45.00	\$80.00
Home No. 1, 1/2 doz.	\$27.00	\$33.00	\$45.00	\$80.00
Little Giant, 1/2 doz.	\$27.00	\$33.00	\$45.00	\$80.00
Nos. 305 310 312 320 322				
Each	\$35.00	\$48.00	\$44.00	\$72.00
Miles' Challenge, 1/2 doz.	45 45 10%			
Nos.				
Each	\$22.00	\$30.00	\$40.00	\$40.00
New Triumph No. 605, 1/2 doz.	\$24.00 \$34.00 \$40.00			

**Heavy Hammers and Sledges—**

8 lb and under..... \$ 1.50  
 10 to 15 lb..... \$ 2.00  
 15 to 20 lb..... \$ 2.50  
 Over 20 lb..... \$ 3.00  
 Wilkinson's Smiths'..... \$ 1.00 @ 10¢

**Handcuffs and Leg Irons**  
See Police Goods.**Handles—**

**Cross-Cut Saw Handles—**  
 Atkins'..... \$ 1.00  
 Champlin..... \$ 1.50 @ 10¢  
 Ely's Perfection..... \$ 2.00 @ 10¢

**Iron, Wrought or Cast—**

Barn Door, \$ 1.40..... \$ 2.00 @ 5¢  
 Bronze Iron Drop Latches..... \$ 2.00 @ 60¢  
 Chest, Sargent's list..... \$ 5.00 @ 10¢  
 Door or Thumb:  
 Nos. 0 1 2 3 4 5  
 \$ 0.90 1.00 1.08 1.35 1.50  
 \$ 2.00 @ 10¢  
 Jap'd Store Door Handles—Nuts, \$ 1.02;  
 Plate, \$ 1.10; no plate, \$ 0.88..... \$ 1.00  
 Roggin's Latches..... \$ 2.00 @ 25¢

**Wood—**

Auger, assorted..... \$ 2.25 @ 25¢  
 Auger, large..... \$ 2.75 @ 30¢  
 File, assorted..... \$ 1.25 @ 10¢  
 Brad Awt..... \$ 1.75 @ 20¢  
 Apple Firmer Chisel, ass'd..... \$ 2.25 @ 25¢  
 Apple Firmer Chisel, large..... \$ 2.75 @ 30¢  
 Hickory Firmer Chisel, ass'd..... \$ 2.25 @ 25¢  
 Hickory Firmer Chisel, large..... \$ 2.75 @ 30¢  
 Socket Firmer Chisel, ass'd..... \$ 1.25 @ 15¢  
 Socket Framing Chisel, ass'd..... \$ 2.50 @ 25¢  
 Hammer, Hatchet, Axe, &c..... \$ 0.50 @ 10¢  
 Hoe, Rake and Fork..... \$ 0.50 @ 10¢  
 Shovel and Spade, Wood B Handle..... \$ 0.50 @ 10¢  
 Hand Saw, Varinshed, \$ 2.75 @ 25¢;  
 not Varin shed..... \$ 2.50 @ 25¢  
 Plane Handles:  
 Jack, \$ 2.00 @ 25¢; Jack Bolted..... \$ 2.50 @ 25¢  
 Fore, \$ 2.00 @ 25¢; Fore Bolted..... \$ 2.50 @ 25¢

**Hangers—**

Barn Door, New Pattern, Round Groove,  
 Regular:  
 Nos. 3 4 5 6 8  
 \$ 1.25 1.68 2.16 2.64 3.30  
 Barn Door, New England Pattern, Check  
 Back, Round Groove, Regular:  
 Nos. 3 4 5 6 8  
 \$ 1.25 1.68 2.16 2.64 3.30

Bigelow & Dowse:  
 Paragon, No. 1, \$ 3.50; No. 2, \$ 4.50;  
 No. 3, \$ 5.50 per doz.

Chicago Spring Butt Co.:  
 Friction..... \$ 35 @ 35¢  
 Oscillating..... \$ 35 @ 35¢  
 Big Twin..... \$ 35 @ 35¢

Chisholm & Moore Mfg. Co.:  
 Advance..... \$ 60 @ 10¢  
 Climax..... \$ 60 @ 10¢  
 Baggage Car Door..... \$ 50 @ 10¢  
 Elevator..... \$ 40 @ 10¢  
 Railroad..... \$ 55 @ 10¢

Cronk Hanger Co.:  
 Roller Bearing..... \$ 70 @ 10¢  
 Steel Covered..... \$ 60 @ 10¢

Lane Bros.:  
 Parlor, Standard..... \$ 40 @ 10¢  
 Barn Door, Standard..... \$ 60 @ 10¢  
 Covered..... \$ 60 @ 10¢  
 Cycle, \$ 12.00..... \$ 33 @ 25¢  
 No. 50..... \$ 40 @ 25¢  
 Parlor Door, New Model..... \$ 40 @ 25¢

Lawrence Bros.:  
 Crown..... \$ 60 @ 10¢  
 New York..... \$ 60 @ 10¢  
 Sterling..... \$ 60 @ 10¢

McKinney Mfg. Co.:  
 No. 2, Standard, \$ 18..... \$ 60 @ 10¢  
 No. 1, Special, \$ 13..... \$ 60 @ 10¢

Payson Mfg. Co.:  
 Pendulum, No. 533..... \$ 2.40

E. C. Stearns & Co.:  
 Davis Parlor Door..... \$ 50 @ 50¢  
 Gem Parlor Sliding Door..... \$ 50 @ 50¢  
 Challenge..... \$ 50 @ 50¢  
 Steel Single Track Parlor..... \$ 50 @ 50¢  
 Royal Parlor Door..... \$ 50 @ 50¢  
 Warner's Pat..... \$ 50 @ 10¢  
 Warner's Imp'd Single..... \$ 40 @ 10¢

Stowell Mfg. and Foundry Co.:  
 Badger..... \$ 60 @ 10¢  
 Baggage Car Door..... \$ 50 @ 10¢  
 Climax Anti-Friction..... \$ 50 @ 10¢  
 Elevator..... \$ 40 @ 10¢  
 Interstate..... \$ 60 @ 10¢  
 Magic..... \$ 50 @ 10¢  
 Matchless..... \$ 60 @ 10¢  
 Nansen..... \$ 60 @ 10¢  
 Parlor Door..... \$ 50 @ 10¢  
 Railroad..... \$ 55 @ 10¢  
 Street Car Door..... \$ 50 @ 10¢  
 Steel Nos. 300, 400, 500..... \$ 45 @ 10¢  
 Wild West..... \$ 50 @ 10¢  
 Zenith for Wood Track..... \$ 55 @ 10¢

Taylor & Boggs Foundry Co.:  
 Kidder's..... \$ 50 @ 50¢  
 Terry Mfg. Co.:  
 Ideal..... \$ 70 @ 10¢  
 Modern..... \$ 70 @ 10¢  
 Modern, Covered..... \$ 70 @ 10¢  
 Safety..... \$ 70 @ 10¢  
 Shield..... \$ 70 @ 10¢  
 Solid..... \$ 70 @ 10¢  
 Wrought..... \$ 70 @ 10¢

Van Wagoner & Williams Hdw Co.:  
 American Trackless..... \$ 33 @ 10¢

Wilcox Mfg. Co.:  
 Aurora Steel Endless..... \$ 60 @ 10¢  
 Bike Roller Bearing..... \$ 60 @ 10¢  
 Bike Steel Endless..... \$ 60 @ 10¢  
 C. J. Roller Bearing..... \$ 60 @ 10¢  
 Cycle Ball Bearing..... \$ 60 @ 10¢  
 Dye Steel..... \$ 60 @ 10¢  
 Economical Single Track..... \$ 50 @ 10¢  
 L. T. Roller Bearing..... \$ 70 @ 10¢  
 New Era..... \$ 50 @ 10¢  
 New Richards..... \$ 60 @ 10¢  
 O. K. Roller Bearing..... \$ 70 @ 10¢  
 Prindle Improved..... \$ 60 @ 10¢  
 Richards' Improved..... \$ 60 @ 10¢  
 Richards' Single Track..... \$ 50 @ 10¢  
 Wilcox Dwarf Roller Bearing..... \$ 40 @ 10¢  
 Wilcox Ives..... \$ 60 @ 10¢  
 Wilcox Tandem Roller Bearing..... \$ 60 @ 10¢  
 Wilcox Trolley Ball Bearing..... \$ 60 @ 10¢  
 Wilcox Trolley Roller Bearing..... \$ 50 @ 10¢  
 Wilcox Trolley Roller Bearing..... \$ 40 @ 10¢  
 Wood Track..... \$ 60 @ 10¢

**Harness Menders—See Menders.****Harness Snaps—See Snaps.****Hasps—**

McKinney's Perfect Hasp, \$ 1.10..... \$ 40 @ 10¢  
 Wrought Hasps, Staples, &c.—See Wrought Goods.

**Hatchets—**

Blood's, Hunt's, Plumb's, Underhill's, etc..... \$ 40 @ 10¢  
 Cheaper Brands..... \$ 50 @ 10¢

**Hay and Straw Knives—**  
See Knives.**Hinges—****Blind Hinges—**

Clark Mfg. Co.:  
 No. 1 Blind Hinge, Old Pattern, "Special"..... \$ 80 @ 10¢  
 No. 1 Blind Hinge, "Diamond" (with tip)..... \$ 80 @ 10¢  
 No. 1 Blind Hinge "Cottage" (with tip)..... \$ 80 @ 10¢  
 Nos. 1, 3, 5 Blind Hinges, Regular..... \$ 80 @ 10¢  
 Nos. 1, 3, 5 Blind Hinges, "Victor" (with double tip)..... \$ 80 @ 10¢  
 No. 50 Blind Hinge, both "Noiseless" and "Empire"..... \$ 80 @ 10¢  
 No. 40—65 Blind..... \$ 80 @ 10¢  
 Lull & Porter Old Style Shutter..... \$ 80 @ 10¢  
 Dixie, L. & P. Shutter..... \$ 80 @ 10¢  
 Buffalo Reversible Shutter..... \$ 80 @ 10¢  
 Mortise Gravity Blind..... \$ 50 @ 10¢  
 Huffer..... \$ 50 @ 10¢  
 Parker..... \$ 75 @ 10¢  
 North's Automatic Blind Fixtures, No. 2 for Wood, \$ 9.00; No. 3, for Brick, \$ 11.50..... \$ 75 @ 10¢  
 Reading's Gravity..... \$ 75 @ 10¢  
 Sargent's, Nos. 1, 3, 5, 11, 13..... \$ 75 @ 10¢

Wrightsville Hdw Co.:  
 Acme, Lull & Porter..... \$ 80 @ 10¢  
 Buffalo Gravity Locking, Nos. 1, 3, 5..... \$ 80 @ 10¢  
 Champion Gravity Locking, No. 75..... \$ 80 @ 10¢  
 1868, Old Pat'n, Nos. 1, 3 & 5..... \$ 80 @ 10¢  
 Tip Pattern, Nos. 1, 3 and 5..... \$ 80 @ 10¢  
 Double Locking, Nos. 20 and 25..... \$ 75 @ 10¢  
 Empire, Nos. 101 and 103..... \$ 80 @ 10¢  
 Niagara Gravity Locking, Nos. 3 and 5..... \$ 80 @ 10¢  
 Noiseless, Nos. 50, 60, 65 and 75..... \$ 80 @ 10¢  
 O. S. Lull & Porter..... \$ 80 @ 10¢  
 Pioneer, Nos. 060, 45 and 54..... \$ 75 @ 10¢  
 Steamboat Gravity Locking, No. 10..... \$ 80 @ 10¢  
 Stanley's Steel Gravity Blind Hinge..... \$ 40 @ 10¢

**Gate Hinges—**

Reversible Self-Closing, with Latch..... \$ 70 @ 10¢  
 Western, with Latch..... \$ 1.25 @ 10¢  
 New England, with Latch..... \$ 1.25 @ 10¢  
 Reversible Self-Closing, without Latch..... \$ 1.45 @ 10¢  
 Western, without Latch..... \$ 1.30 @ 10¢  
 New England, without Latch..... \$ 1.00 @ 10¢

**Spring Hinges—**

J. Bardeley:  
 Bardsley's Patent Checking..... \$ 15 @ 10¢  
 Bommer Bros.:  
 Bommer's..... \$ 40 @ 10¢  
 Chicago Spring Butt Co.:  
 Chicago..... \$ 30 @ 10¢  
 Garden City Engine House..... \$ 30 @ 10¢  
 Keene's Saloon Door..... \$ 30 @ 10¢  
 Lawson Mfg. Co.:  
 Ma ch 88..... \$ 25 @ 10¢  
 Matchless Pivot..... \$ 40 @ 10¢  
 Payson Mfg. Co.:  
 Oblique, Dbl. Acting..... \$ 50 @ 50¢  
 E. C. Stearns & Co.:  
 Nos. 45 and 51..... \$ 70 @ 10¢  
 Stover Mfg. Co.:  
 Ideal, No. 16, Detachable..... \$ 2.50 @ 10¢  
 Ideal, No. 4..... \$ 3.00 @ 10¢  
 New Idea No. 1..... \$ 3.00 @ 10¢  
 New Idea, Double Acting..... \$ 4.50 @ 10¢  
 Van Wagoner & Williams Hdw Co.:  
 Acme..... \$ 30 @ 10¢  
 American..... \$ 30 @ 10¢  
 Columbia, No. 18..... \$ 34 @ 10¢  
 Crown..... \$ 30 @ 10¢  
 Gem..... \$ 30 @ 10¢  
 Knoxall..... \$ 30 @ 10¢  
 Oxford..... \$ 30 @ 10¢

**Wrought Iron Hinges—**

Strap and I Hinges, &c., list Mar. 15, 1899:  
 Light Strap Hinges..... \$ 75 @ 10¢  
 Heavy Strap Hinges..... \$ 80 @ 10¢  
 Light T Hinges..... \$ 70 @ 10¢  
 Heavy T Hinges..... \$ 75 @ 10¢  
 Extra Heavy T Hinges..... \$ 80 @ 10¢  
 Plate Hinges:  
 Providence..... \$ 6 to 12 in. \$ 2 @ 10¢  
 Rolled Blind Hinges, Nos. 32 and 34..... \$ 50 @ 10¢  
 Rolled Plate..... \$ 70 @ 10¢  
 Screw Hook..... \$ 14 to 20 in. \$ 2 @ 10¢  
 and Strap..... \$ 22 to 36 in. \$ 1 @ 10¢  
 Screw Hook and Eye:  
 1/2 to 1 in. d. m..... \$ 4 @ 10¢  
 1/2 in. d. m..... \$ 4 @ 10¢  
 1/2 in. d. m..... \$ 7 @ 10¢

**Hoes—****Eye—**

D. & H. Scovill..... \$ 35 @ 95¢  
 Scovill and Oval Pattern..... \$ 60 @ 80¢  
 Grub..... \$ 75 @ 10¢

**Handled—**

Field and Garden..... \$ 80 @ 25¢  
 Ladies', Boys', Toy and Onion..... \$ 80 @ 25¢  
 Street and Mortar..... \$ 75 @ 25¢  
 Cotton..... \$ 80 @ 10¢  
 Planters'..... \$ 80 @ 15¢  
 Weeding..... \$ 75 @ 25¢  
 Ft. Madison Crucible Garden Hoe..... \$ 75 @ 20¢  
 Ft. Madison Crescent Cultivator Hoe..... \$ 83.50 @ 20¢  
 Ft. Madison Mattock Hoe..... \$ 83.75 @ 20¢  
 Ft. Madison Sprouting Hoe..... \$ 44.50 @ 20¢  
 Ft. Madison Dixie Tobacco Hoe..... \$ 80 @ 10¢  
 Warren Hoe..... \$ 60 @ 10¢

**Hog Rings and Ringers—**  
See Rings and Ringers.**Hoisting Apparatus—**  
See Machines, Hoisting.**Hollow Ware—**  
See Ware, Hollow.**Holders—Bag—**  
Sensible Bag and Twine..... \$ 50 @ 10¢**Bit—**

Angular, \$ 2.00..... \$ 45 @ 10¢  
 Extension..... \$ 45 @ 10¢  
 Barber's, \$ 2.00..... \$ 45 @ 10¢

**File and Tool—**

Nicholson File Holders and File Handles..... \$ 33 @ 10¢

**Hooks—****Cast Iron—**

Bird Cage, Reading..... \$ 60 @ 10¢  
 Bird Cage, Sargent's List..... \$ 70 @ 10¢  
 Clothes Line, Sargent's List..... \$ 50 @ 10¢  
 Clothes Line, Stowell's..... \$ 70 @ 10¢  
 Clothes Line, Reading List..... \$ 85 @ 10¢

Coat and Hat, Stowell's..... \$ 70 @ 10¢  
 Coat and Hat, Reading..... \$ 60 @ 10¢  
 Coat and Hat, Sargent's List..... \$ 50 @ 10¢  
 Coat and Hat, Wrightsville list..... \$ 70 @ 10¢  
 Harness, Reading List..... \$ 70 @ 10¢

**Wire—**

Atlas, Coat and Hat..... \$ 50 @ 50¢  
 Belt..... \$ 80 @ 10¢  
 Buffalo Belt Fasteners..... \$ 40 @ 10¢  
 Wire Coat and Hat..... \$ 60 @ 10¢  
 Acme..... \$ 60 @ 10¢  
 B. B..... \$ 75 @ 10¢  
 Gem..... \$ 60 @ 10¢  
 Bright Wire Goods—See Wire.

**Wrought Iron—**

Box, or Case, Octagon Steel..... \$ 2.00 @ 3.15  
 Cotton..... \$ 1.00 @ 1.10  
 Figure, T. & S. Mfg. Co..... \$ 75 @ 10¢  
 Tassel, T. & S. Mfg. Co..... \$ 50 @ 10¢  
 Wrought Staples, Hooks, &c.—See Wrought Goods.

**Miscellaneous—**

Bush, Light, \$ 5.00; Medium, \$ 5.50; Heavy, \$ 6.00  
 Covert Saddlery Wor. a' Self Locking Gate and Door Hook, 4 in. \$ gross \$ 13.00; 6 in. \$ 17.20..... \$ 70 @ 10¢  
 Crown Picture..... \$ 60 @ 10¢  
 Grass, No. 2, \$ 1.65; No. 3, \$ 1.80; No. 4, \$ 2.00..... \$ 2.00 @ 10¢  
 Potato and Manure..... \$ 75 @ 15¢  
 Hooks and Eyes—Brass..... \$ 70 @ 10¢  
 Hooks and Eyes—Malleable Iron..... \$ 75 @ 10¢  
 Whiffletree, &c..... \$ 4 @ 10¢  
 Bench Hooks—See Bench Stops.  
 Corn Hooks—See Knives, Corn.

Horse Nails—See Nails, Horse.  
 Horseshoes—  
 See Shoes, Horse.  
 Hose, Rubber—  
 Garden Hose, 3/4-inch:  
 Competition..... \$ ft. 4 @ 4¢  
 3-ply Standard..... \$ ft. 5¢  
 4-ply Standard..... \$ ft. 6¢  
 3-ply extra..... \$ ft. 6¢  
 4-ply extra..... \$ ft. 7¢  
 High Grade..... \$ ft. 8¢  
 Cotton Garden, 3/4 in., coupled:  
 Fair quality..... \$ ft. 7¢  
 Good quality..... \$ ft. 8¢

From 4 to 10..... \$ 2 @ 2¢  
 R. B. Sad Irons..... \$ 2 @ 2¢  
 Chinese Laundry..... \$ 3 @ 2¢  
 Crown Improved, Pol., Nickel..... \$ 3 @ 2¢  
 Troy Pol. Irons..... \$ 3 @ 2¢  
 Mrs. Potts', per set:  
 No. 50..... \$ 55 @ 60¢  
 No. 55..... \$ 71 @ 74¢  
 No. 60..... \$ 67 @ 70¢  
 New England Pressing..... \$ 2 @ 2¢  
 Sensible Sad Irons, Pol., Nickel, \$ 7.00.

**Soldering—**

Soldering Coppers..... \$ 21 @ 25¢  
 Covert Mfg. Co..... \$ 35 @ 25¢

**Pinking—**

Pinking Irons..... \$ 55 @ 60¢

**Jack Screws—See Screws.****Jacks, Wagon—**

Covert Mfg. Co., Steel..... \$ 45 @ 25¢  
 Daisy, \$ 2.00..... \$ 70 @ 10¢  
 Lockport..... \$ 40 @ 40¢  
 Victor, \$ 2.00..... \$ 70 @ 10¢  
 Lane's Steel..... \$ 80 @ 10¢

**Kettles—**

Brass, Spun, Plain, list Jan. 10, '99, 15 @ 20¢  
 Enamelled and Tea—See Ware, Hollow.

**Knife Sharpeners—**  
See Sharpeners, Knife.**Knives—**  
Butcher, Shoe, &c.—

Dick's Butcher Knives..... \$ 40 @ 10¢  
 Foster Bros.' Butcher, &c..... \$ 40 @ 10¢  
 Nichols' Butcher Knives..... \$ 50 @ 10¢  
 Table and Pocket Cutlery and John Wilson's Butcher Knives—Net prices.  
 Hay and Straw—See Hay Knives.

**Corn—**

Ft. Madison Cut-Easy, \$ 2.00..... \$ 3.00 @ 10¢

**Drawing—**

Standard list..... \$ 75 @ 10¢  
 Adjustable Handle..... \$ 25 @ 33¢  
 Bradley's..... \$ 35 @ 10¢  
 Douglass..... \$ 75 @ 75¢  
 Watrous..... \$ 80 @ 10¢  
 L. & I. J. White..... \$ 20 @ 25¢  
 Cautelo's Folding..... \$ 50 @ 50¢

**Hay and Straw—**

Blizzard..... \$ 5.50 @ 6.00  
 Iwan's Sickle Edge..... \$ 10.50 @ 10.50  
 Lightning, from Jobbers..... \$ 5.00 @ 6.00

**Mincing—**

Buffalo Adjustable, \$ 3.00..... \$ 40 @ 10¢  
 Knapp & Cowles..... \$ 60 @ 10¢  
 Smith's, \$ 2.00, Single, \$ 2; Double, \$ 4..... \$ 45 @ 50¢  
 Sensible, Nos. 10, 20, 40 and 60..... \$ 45 @ 50¢

**Miscellaneous—**

Farmers'..... \$ 2.00 @ 3.00

**Knobs—**

Base, 2 1/2-in., Birch, Rubber tip, \$ gro. \$ 1.25 @ 1.40  
 Bardsley's Wood Door, Shutter, &c..... \$ 15 @ 10¢  
 Carriage, Jap., \$ gr. 80¢..... \$ 60 @ 10¢  
 Door, Mineral..... \$ 60 @ 10¢  
 Door, Por. Jap'd..... \$ 65 @ 87¢  
 Door, Por. Nickel..... \$ 1.70 @ 1.80  
 Drawer, Porcelain..... \$ 60 @ 10¢  
 Picture, Sargent's..... \$ 70 @ 10¢  
 Shutter, Porcelain..... \$ 70 @ 10¢  
 Yale & Towne Wood, list Dec., '85..... \$ 40 @ 10¢

**Ladles—Melting—**

P. S. & W..... \$ 35 @ 10¢  
 Reading..... \$ 60 @ 10¢  
 Sargent's..... \$ 60 @ 10¢

**Lanterns—Tubular—**

Regular Tubular..... \$ 7.00 @ 40¢  
 Side Lift Tubular..... \$ 7.50 @ 10¢  
 Square Lift Tubular..... \$ 7.50 @ 10¢

**Bull's Eye Police—**

2 1/2-inch flash light..... \$ 4.00 @ 4.00  
 3-inch flash light..... \$ 4.50 @ 4.50  
 3 1/2-inch regular..... \$ 4.50 @ 4.50  
 8-inch regular..... \$ 5.90 @ 5.90

**Lawn Mowers—**  
See Mowers, Lawn.**Leaders, Cattle—**

Covert Mfg. Co..... \$ 45 @ 25¢  
 Peck, Stow & W. Co..... \$ 60 @ 10¢  
 Sargent's..... \$ 70 @ 10¢

**Lemon Squeezers—**  
See Squeezers, Lemon.**Lifters, Transom—**

Excelstor..... \$ 60 @ 60¢  
 Payson's..... \$ 100 @ 100¢  
 Solid Grip Nos. 303 and 304, \$ 100.  
 Other sizes..... \$ 10 @ 10¢  
 Shaw's..... \$ 60 @ 60¢

**Lines—**

Ossawan Mills.  
 Crown Solid Braided Chalk..... \$ 33 @ 10¢  
 Mason's, No. 0 to No. 5..... \$ 33 @ 10¢  
 Silver Lake Braided Chalk, No. 0, \$ 6.00;  
 No. 1, \$ 6.50; No. 2, \$ 7.00; No. 3, \$ 7.50;  
 \$ gr..... \$ 10 @ 10¢  
 Wire Clothes, Nos. 18 19 20  
 100 feet..... \$ 2.40 2.15 1.90  
 75 feet..... \$ 1.35 @ 1.35

**Locks, &c.—Cabinet—**

Cabinet Locks..... \$ 45 @ 25¢



**Door Locks, Latches, &c.**

[Net prices are very often made on these goods.]

Plate	33 1/2
Reading	60@60 1/2
R. & E. Mfg. Co.	60@10@70
Sargent & Co.	30@10@60 1/2
S. B. & Co., Locks, Knobs, &c.	40@40 1/2

**Elevator—**

Stowell's	33 1/2
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**Padlocks—**

Wrought Iron, list Dec. 3, '97	75@10@80
Dog Collar, S. B. Co.	40
E. T. Fraim:	
Cast Iron, Scandinavian	90@40
Mal. Iron, 120 line	90@10
Mal. Iron, 110 and 125 line	65
All others	50@55
Scandinavian	90@40@90 1/2
S. B. & Co.	40

**Sash, &c.—**

Fitch's Patent	70@10
Ives' Patent	60 1/2@22
Payson's Perfect	70
Payson's Signal	70@10
Reading	60@10@70

**Machines—****Boring—**Without Augers.  
Upright. Angular.

Boss, Carpenters'	\$3.50
Boss, Ship Bldrs'	3.75
Douglas	2.50
Jennings	2.50
Millers' Falls	5.75
Snell's, Rice's Pat.	2.50

**Fluting—**

Crown Jewel, 6 in.	\$2.50@2.75
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**Hoisting—**

Moore's Anti-Friction Differential Pulley Block	30
Moore's Hand Hoist, with Lock Brake	20 1/2
Morris & Beckley (Teal Patent)	30 1/2

**Washing—**

Wayne American, No. 2	\$27.50
Western Star, No. 2	27.50
doz.	30.00
Western Star, No. 3	30.00
doz.	30.00
St. Louis, No. 41	68.00

**Mallets—**

Hickory	50@50 1/2
Lignumvitae	50@50 1/2
Tinners', Hickory and Applewood	50
Fiber Head, Stearns'	25 1/2

**Mattocks—**

Standard List	75@10 1/2
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**Measures—**

Peck and Half Peck, See Ware, Standard and Fiber.	
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**Meat Cutters—**

See Cutters, Meat.

**Menders—**

Centaur Harness Menders	\$ doz.
Jones' Hose Menders	\$ doz.
Victor Complete Hose Menders	\$ doz.

**Milk Cans—See Cans, Milk.****Mills—Coffee—**

Box and Side, list Jan. 1, '88	60@10@60 1/2
Net prices are often made on some goods which are lower than above discounts.	
Enterprise Mfg. Co., list Jan. 17, '93	30
National, list Jan. 1, '94	30 1/2
Walker's Columbia and Victor	60@10 1/2
Walker's Upright	30@10@40 1/2
Swift, Lane Bros.	35 1/2

**Mincing Knives—**

See Knives, Mincing.

**Molasses Gates—**

See Gates, Molasses.

**Money Drawers—**

See Drawers, Money.

**Mowers, Lawn—**

Net prices are very frequently quoted	
Cheap	10 12 14 16-inch
Medium	1.65 1.70 1.75 1.80
High Grade	2.50 2.75 3.00 3.25
Pennsylvania and Continental	3.50 3.75 4.00 4.25

**Philadelphia:**

All Styles except A and E	70@10 1/2
Style A, all Steel	60@10 1/2
Style E, Low Wheel	60@10 1/2
Style E, High Wheel	10@10 1/2
Racine	60@10 1/2

**Muzzles—**

Safety	\$ gr. \$12.00@12.50
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**Nails—**Cut and Wire. See Trade Report.  
Wire Nails and Brads, Papered. List.  
May 1, '92. Mfr's. price 85@10 1/2  
Hungarian, Finishing, Upholsterers', &c.  
See Tacks.**Horse—**

Nos. 6 7 8 9 10	
A. C.	25 23 22 21 21
American	9 1/2 9 1/4 9 1/4 9 1/4 9 1/4
Ausable	25 26 25 24 23
Capwell	19 18 17 16 15
C. B. K.	25 23 22 21 21
Champlain	25 26 25 24 23
Clinton Fin.	19 17 16 15 14
Maud S.	25 23 22 21 21
Neposet	23 21 20 19 18
Putnam	23 21 20 19 18
Vulcan	23 21 20 19 18

**Picture—**

Brass Head, Combination list	50@10 1/2
Brass Head, Sargent's list	70@10@70 1/2
Porcelain Head, Combination list	40@10 1/2
Porcelain Head, Sargent's list	50@10 1/2
Crown	50@10 1/2
Niles' Patent	40

**Nippers, See Pliers and Nippers.****Nut Crackers—**

See Crackers, Nut.

**Nuts—List Dec. 18, 1889.**

Cold Punched	Off list.
Mfrs. or U. S. Standard.	
Hexagon, plain	\$6.50
Square, plain	6.10
Square, C. T. & R.	6.20
Hexagon, C. T. & R.	7.10
Hot Pressed.	
Mfrs. U. S. or Nar. Gauge Standard.	\$6.40
Square	7.20
Hexagon	7.20

**Oakum—**

Best or Government	\$ doz. 5 1/2
Navy	\$ doz. 5 1/2
U. S. Navy	\$ doz. 5 1/2
Plumbers' Spun Navy	\$ doz. 5 1/2
F. o. b. New York In carload lots	\$ doz. 5 1/2

**Oil Tanks—See Tanks, Oil.****Oilers—**

Brass and Copper	50@10@60
Zinc and Tin	75@75 1/2
Malleable, Hammers' Improved, No. 1	\$3.60; No. 2, \$4; No. 3, \$4.40
Malleable, Hammers' Old Pattern, same list	50@10 1/2
Wilmot & Hobbs Mfg. Co.	70@10@75

**Openers, Can—**

French	\$ doz. 35 1/2
Iron Handle	\$ doz. 60@75
Kio adike, Rogers & Bros.	\$ doz. 60 1/2
National, \$ gr.	\$1.75@2.00
Sardine Scissors	\$ doz. \$2.00@2.10
Sprague, Iron or Wood Handles	\$ doz. 40@45
Stowell's	75@10 1/2

**Streeter's:**

Sensible, Japanned	\$ gr. \$3.50
Sensible, Nickel	\$ gr. \$5.50
Surprise	\$ gr. \$2.00
New Sprague, Metallic Handle	\$ gr. \$3.50
New Sprague, Wood Handle	\$ gr. \$4.50

**Packing—****Rubber—**

Standard, fair quality	70@10@75
Inferior quality	75@10@80
Extra	60@5@60 1/2
Jenkins' Standard	\$ doz. 25@25 1/2

**Miscellaneous—**

American Packing	9 1/2@10 1/2
Cotton Packing	13 1/2@14 1/2
Italian Packing	10 1/2@11 1/2
Jute	5 1/2@5 1/2
Russia Packing	12 1/2@13 1/2

**Pails—****Creamery—**

S. S. & Co., with gauges. No. 1	\$5.25;
No. 2	\$5.50

**Galvanized—**

Inch	10 12 4
Water, Standard	\$16.50 \$18.50 \$20.50
Water, Competition	\$14.00 \$16.00 \$18.00
Fire	\$19.00 \$22.50 \$25.50
Well	\$21.00 \$24.00 \$25.00

**Pans—****Dripping—**

Large Sizes	\$ 3 1/2@4 1/2
Small sizes	\$ 4 1/2@5 1/2

**Fry—**

Standard List	80@80 1/2
No. 0	1 2 3
\$ doz. \$3.00 \$3.75 \$4.25 \$4.75 \$5.25	
No. 1	5 6 7 8
\$ doz. \$6.00 \$7.00 \$8.00 \$9.00	
Acme Fry Pans	75@75 1/2

**Roasting and Baking—**

Columbian, S. S. & Co., Nos. 5	\$ doz.
\$10; 10, \$11.50; 20, \$13; 30, \$15	60
Simplex No. 88	\$ doz. \$7.00; No. 99
\$5.50	60

**Paper—****Building Paper—**

Per roll	
Rosin Sized Sheathing	500 sq. ft.
Light wt., 20 sq. ft. to lb.	\$0.35@0.40
Medium wt., 12 sq. ft. to lb.	\$0.55@0.60
Heavy wt., extra quality	\$0.95@1.05
Barrett's Water Proof Sheathing	\$1.35@1.75
Medium Grades Water Proof Sheathing	\$0.80 to 1.25
Deafening Felt, 9, 6 and 4 1/2 sq. ft. to lb.	\$4.50

**Tarred Paper.**

1 ply (roll 300 sq. ft.)	\$35@37
2 ply, heavy, roll 100 sq. ft.	90
2 ply, light, roll 100 sq. ft.	75
3 ply, heavy, roll 100 sq. ft.	120
3 ply, light, roll 100 sq. ft.	100

**Sand and Emery—**

List April 19, 1886	50@10@50 1/2
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**Parers—**

Advance	\$ doz. \$4.50
Baldwin	\$ doz. \$5.00
Bonanza	each \$5.00
Dandy	each \$7.50
Eureka, 1888	each \$16.00
Family Bay State	\$ doz. \$12.00
Improved Bay State	\$ doz. \$27.00@30.00
New Lightning	\$ doz. \$5.50
Penn.	\$ doz. \$4.75
Perfection	\$ doz. \$4.00
Reading 72	\$ doz. \$4.00
Reading 78	\$ doz. \$7.00
Turn Table	\$ doz. \$4.50
White Mountain	\$ doz. \$4.00

**Potato—**

Saratoga	\$ doz. \$5.50
White Mountain	\$ doz. \$4.50

**Paris Green—**

Arsenic Eggs or corks	\$ doz. \$12 1/2
Kegs of 100 to 175 pounds	\$ doz. \$12 1/2
Kits of 14, 28 and 56 pounds	\$ doz. \$13 1/2
Paper boxes 2 to 5 pounds	\$ doz. \$13 1/2
Paper boxes 1 pound	\$ doz. \$14 1/2
Paper boxes 1/2 pound	\$ doz. \$15 1/2
Paper boxes 1/4 pound	\$ doz. \$16 1/2

**Picks and Mattocks—**

Railroad or Adze Eye, 5 to 6	\$ doz. \$12.00; 6 to 7, \$13.00
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**Pinking Irons—**

See Irons, Pinking.

**Pins—**

1 1/2-inch	\$ gro. \$4.50@5.50
2-inch	\$ gro. \$5.00@5.50

**Escutcheon—**

Brass	70@70 1/2
Iron, list Nov. 11, '85	60@60 1/2

**Pipe, Cast Iron Soil—**

Factory Shipments.	
Standard	75@5@75 1/2
Extra Heavy	75@10@80 1/2
Fittings	80@80 1/2

**Pipe, Wrought—**

Factory Shipments.	
List Jan. 29, '95.	
1 1/2 and under Plain	55 1/2
1 1/2 and under Galv.	45 1/2
1 1/2 and over, Plain	65 1/2
1 1/2 and over, Galv.	55 1/2
Cold Drawn Seamless Steel Tubing	.60

**Planes and Plane Irons—**

Wood Planes—	
Molding	45@45 1/2
Bench, First quality	50@50 1/2
Bench, Second quality	50@10@50 1/2
Bailey's (Stanley R. & L. Co.)	50@10@50 1/2

**Iron Planes—**

Bailey's (Stanley R. & L. Co.)	50@10@50 1/2
Chaplin's Iron Planes	50@10@50 1/2
Miscellaneous Planes (Stanley R. & L. Co.)	50@10@50 1/2
Sargent's	60@10@70 1/2

**Plane Irons—**

Standard List	30@10@30 1/2
Auburn Thistle	30@10@30 1/2
Buck Bros.	30
Butcher's	\$5.00@5.25 to 2
Stanley R. & L. Co.	50@10@50 1/2
L. & J. White	20@5@25 1/2

**Plates—**

Felloe	\$ 6@6 1/2
Self-Sealing Pie Plates (S. S. & Co.)	\$ doz. \$2.00

**Pliers and Nippers—**

Acme Nippers	50
Bernard's	33 1/2
Parallel Pliers, &c.	50
Paragon Pliers	50
Lock Pliers	50
Elm City Fence Pliers	35 1/2
Button's	70@10@70 1/2
Cronk's Patent Pliers	60
Cronk's Stubbs' Pat. Pliers	50@10 1/2

**Cronk's Button Pattern**

Cronk's Comb. Cutting and Gas Pliers

\$ doz. \$20.00, 60

**Gas Pliers. \$ doz.:**

Best 7-in. 8-in. 9-in. 10-in.

Good \$2.50 2.75 3.00 3.50

Heller's Farmers' Pincers and Tools

Morrell's Parallel, \$ doz. \$12.00, 30 1/2

P. S. & W. Cast Steel 50@50 1/2

P. S. & W. Tinners' Cutting Nippers, add 6%

Utica Drop Forge & Tool Co.

Combination Pliers 40 1/2

Side Cutting Pliers 40 1/2

Hall Patent Nipper 40 1/2

Round and Flat Nose Pliers 40 1/2

End Cutting Pliers 40 1/2

Royal Blue 40 1/2

Glass Pliers 40 1/2

Burner Pliers 40 1/2

**Plumbs and Levels—**

Plumbs and Levels

Cook's 70@10@70 1/2

40@10@40 1/2

Pocket Levels 70@10@70 1/2

Stanley R. & L. Co. 70@10@70 1/2

Stanley's Duplex 25@10@25 1/2

Wood's Extension 35 1/2





Slates—(From store).

"D" Slates.....50&10&10&10&5%  
Unexcelled Notched Slates, 60&10&10&10&5%  
Victor slates.....60 and eight 10s and 5%

Slaw Cutters—See Cutters.

Snaps Harness—

Covert Mfg. Co.:  
Deroy.....45&2%  
High Grade.....45&2%  
Jockey.....45&2%  
Trojan.....45&2%  
Covert's Saddlery Works:  
Banner.....75%  
Crown.....70%  
Triumph.....70%  
W. & E. T. Fitch:  
Bristol.....40&10%  
Empire.....50&5%  
National.....50&5%  
Clipper.....50&10&5%  
Champion.....40&10%  
Victor.....60&5%  
German.....50&5%  
Sargent's Patent Guarded.....70&10&70&10&10%  
Snaths—  
Scythe.....55%  
Snips, Tinnners'—See Shears.  
Soldering Irons—  
See Irons, Soldering.  
Spoke Trimmers—  
See Trimmers, Spoke.  
Spoons and Forks—  
Tinned Iron—  
Basting, Cen. Stamp Co.'s list. 75&10&90%  
Solid Table and Tea, Cen. Stamp Co.'s list. 70&25%  
Silver Plated—  
Flat Ware.....60&5&60&10&5%  
Rogers & Brother.....60%  
C. Rogers & Bros.....60%  
Wm. Rogers Mfg. Co.....60%  
Miscellaneous—  
German Silver.....60&10%  
C. Rogers & Bros.:  
18 per cent. German Silver.....60%  
18 per cent. Nickel silver.....60%  
Silver Metal.....50&10%  
Wm. Rogers Mfg. Co.:  
18% German Silver.....60%  
Rogers' Silver Metal.....60&10%  
Springs—  
Door—  
Champion (Coil).....50&10&50&10&10%  
Gem (Coil).....25%  
Rubber, complete.....\$ gro. \$15.00  
Star (Coil).....33&10%  
Torrey's Rod, 3/8 in., 2 doz. \$1.10; 1 doz. \$3.40.  
Warner's No. 1, 1/2 doz. \$1.50; No. 2, 1/2 doz. \$5.55; 1 doz. \$10.55  
Victor (Coil).....60&10&60&10&5%  
Carriage, Wagon, &c.  
Billie, Concord, Platform and Half Scroll, 60&10&60&10&10&10 or following net prices:  
Tempered Oil Tempered.  
Blk. Brt. Blk. Brt.  
14 in.....5% 6% 6% 6%  
16 in.....5% 6% 6% 6%  
18 in.....5% 6% 6% 6%  
19 in.....5% 6% 6% 6%  
Cliff's Bolster Springs.....40&2%  
Cliff's Seat Springs.....\$ pair 45¢  
Sprinklers, Lawn—  
Enterprise.....25&30%  
Philadelphia No. 1, 1/2 doz. \$12; No. 2, 1/2 doz. \$3.24.  
Squares—  
Nickel plated.....List May 1, '95  
Steel and Iron.....75&10&30&3%  
Rosewood Hdl. Try Square and T-Bevels.....60&10&10&70%  
Iron Hdl. Try Squares and T-Bevels.....40&10&40&10&10%  
Dialton's Try Sq. and T-Bevels.....60&10%  
Winterbottom's Try and Miter.....50&10%  
Squeezers—  
Lemon—  
Wood, Common, 1/2 gr. No. 0, \$5 00;  
No. 1, \$6.50; No. 2, \$10.00.  
Wood, Porcelain Lined, No. 1, 1/2 doz. \$3.25; 3 doz. \$3.25; 4 doz. \$3.25; 5 doz. \$3.25; 6 doz. \$3.25; 7 doz. \$3.25; 8 doz. \$3.25; 9 doz. \$3.25; 10 doz. \$3.25.  
Tinned Iron.....1/2 doz. \$0.80; 1 doz. \$1.25  
Iron, Porcelain Lined, 1/2 doz. \$3.25; 3 doz. \$3.50  
Hotchkiss Straight Flash.....1/2 doz. \$9.00  
Jennings' Star.....1/2 doz. \$1.85; 1 doz. \$1.90  
King.....1/2 doz. \$1.85; 1 doz. \$2.00  
Staples—  
Barbed Blind, 1/2, 3/4 and 1/2 in., 1/2 doz. \$3.50; 3 doz. \$3.50  
Fence Staples, Galvanized (Same price)  
Fence Staples, Plain.....See Trl. Rep.  
Grand Crossing Tack Co.'s list.....75&10%  
Steels, Butchers'—  
Dick's.....40%  
Foster Bros.....40%  
C. & A. Hoffmann's.....40%  
Nichols Bros.....50%  
John Wilson's, list Sep. 1, '94.....25%  
Steelyards.....40&40&10%  
Stocks and Dies—  
Blacksmith:  
Waterfield's Goods.....35&40%  
Watertown.....35&40%  
Garlin.....40&10%  
Green River.....25%  
Lightning Screw Plate.....25%  
Little Giant.....25%  
Reece's New Screw Plates.....25%  
Reversible Ratchet.....25%  
Stone—  
Scythe Stones—  
Pike Mfg. Co., list '95-'96.....\$3.45

Cleveland Stone Co., list Nov., '92, 33 1/2%

Oil Stones, &c.

Pike Mfg. Co.:  
Hindostan No. 1, 1/2 doz. \$8%  
Sand Stone.....5%  
Turkey Oil Stone, Extra.....33 1/2%  
5 to 8 in.....33 1/2%  
Turkey Slips.....\$2.00  
Lily White Washita.....60%  
Rosy Red Washita.....60%  
Washita Stone, Extra.....50%  
Washita Stone, No. 1.....40%  
Washita Stone, No. 2.....30%  
Lily White Slips.....90%  
Rosy Red Slips.....90%  
Washita Slips, Extra.....90%  
Washita Slips, No. 1.....70%  
Arkansas Stone, No. 1, 5 to 5 1/2 in. \$2.80  
Arkansas Stone, No. 1, 5 to 5 1/2 in. \$3.50  
Tanite Mills:  
Emery Oil, 1/2 doz. \$3.00.....50&60%  
Stoners—  
Cherry—  
Enterprise.....25&30%  
Stops, Bench—  
Cincinnati.....25&10%  
Seymour Smith & Son, 1/2 doz. No. 1, \$3.50; No. 2, \$3.20  
Morrill's.....15&10%  
Morrill's.....1/2 doz. No. 1, \$11.00; 4 doz. \$48.20%  
Stearns.....30&5%  
Tatum's.....40%  
Stops, Window—  
Taplin's.....45%  
Stove Boards—  
See Boards, Stove.  
Stove Polish—See Polish, Stove.  
Straps, Box—  
Cary's Universal.....20&10&10%  
Stretchers, Carpet—  
Cast Iron, Steel Points.....1/2 doz. 70&75%  
Cast Steel, Polished.....1/2 doz. \$2.25  
Socket.....1/2 doz. \$1.75  
Bullard's.....25&10&40%  
Stuffers, Sausage—  
Miles' Challenge, 1/2 doz. \$20.....50&50&5%  
Enterprise Mfg. Co., list Jan. 17, '93.....25&25&7%  
National Specialty Mfg. Co., list Jan. 1, '97.....25%  
Sweepers, Carpet—  
Bissell:  
Cosmopolitan, Cyco Bearing.....\$24.00  
Criterion.....\$16.00  
Furniture Protector, Japanned.....\$22.00  
Furniture Protector, Nickel.....\$24.00  
Gold Medal, Cyco Bearing.....\$24.00  
Grand, Cyco Bearing.....\$24.00  
Grand Rapids, Japanned.....\$22.00  
Grand Rapids, Nickel.....\$24.00  
H.B. Cyco Bearing.....\$20.00  
Improve Crown Jewel, Jap'd.....\$19.00  
Improved Victor.....\$21.00  
Popular.....\$18.00  
Premier, Cyco Bearing.....\$24.00  
Prize, Cyco Bearing.....\$24.00  
Standard, Japanned.....\$20.00  
Standard, Nickel.....\$22.00  
Superior, Cyco Bearing.....\$24.00  
Welcome, Cyco Bearing.....\$24.00  
Toy Line: Misses', \$9; Little Jewel, \$6; Little Queen, \$3.50; Child's, \$2.50; Baby, \$2; Daisy, \$1.50.  
Goshen:  
Acme, Nickel.....\$24.00  
Banner.....\$20.00  
Champion.....\$12.00  
Common Sense, Nickel.....\$24.00  
Easy, Jap'd, \$20. Nickel, \$22.00  
Gilt Edge, Nickel.....\$24.00  
Grand Republic (18 inch) Nickel, \$33.00  
Imperial, Nickel.....\$25.00  
Ladies' Friend No. 1.....\$15.00  
Ladies' Friend No. 2.....\$18.00  
Little Pet.....\$6.00  
Model, Nickel.....\$24.00  
Our Best, Nickel.....\$24.00  
Our Leader.....\$18.00  
Our Own, Nickel.....\$24.00  
Rapid, Nickel.....\$22.00  
Reliable.....\$20.00  
Select, Nickel.....\$22.00  
Star.....\$19.00  
Toy.....\$15.00  
Triumph.....\$19.00  
Sweeperette:  
No. 2, Oak, Jap'd.....\$18.00  
No. 4, Special, Oak and Birch, Nickel.....\$20.00  
No. 4, Regular, Oak and Birch, Nickel.....\$22.00  
No. 6, Oak and Mahogany, Nickel.....\$24.00  
Diamond Medal.....\$27.00  
Comfort.....\$24.00  
Companion.....\$15.00  
Sunbeam, Toy.....\$3.00  
Dolly, Toy.....75¢  
Tacks, Brads, &c.—  
List Jan. 15, '99.  
Carpet Tacks.....90&33 1/2%  
American Blued.....90&40%  
American Tinned.....90&40%  
American Cut Tacks.....90&25%  
Swedes Iron Tacks.....90&33 1/2%  
Upholsterers' Tacks.....90&50%  
Gimp Tacks.....90&50%  
Lace Tacks.....85&10%  
Looking Glass Tacks.....90&33 1/2%  
Bill Posters' and Railroad Tacks.....75%  
Hungarian Nails.....90&33 1/2%  
Common and Patent Brads.....75&10%  
Trunk and Clout Nails:  
Blued.....60&10%  
Tinned.....60&10%  
Miscellaneous—  
Double Point Tacks, 90 & 4 or 5 tens.  
Steel Wire brads, R. & E. Mfg. Co.'s list.....50&10&90%  
See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.00  
Emerald, S. S. & Co.....60-gal. \$3.75  
Queen City S. S. & Co., 60-gal., each \$4.09;  
100-gal., \$5.25; 120-gal., \$5.50; 200-gal., \$14.00; 250-gal.....\$17.75  
Wilson's:  
No. 9.....60&10%  
Aztec, Force Pump.....60&10%  
Cone Top, Measuring Pump.....60%  
Cabinet, Measuring Pump.....50%  
Gasoline Tanks.....60&10%  
Tapes, Measuring—  
American Asses Skin.....40&10&50%  
Patent Leather.....25&25&10%  
Steel.....33&40%  
Chesterman's.....25&25&5%  
Keuffel & Esser Co., Steel and Metallic, new list, 18%  
Lufkin's Steel and Metallic.....33 1/2%  
Thermometers—  
Tin Case.....80&10%  
Ties, Bale—Steel.  
Standard Wire, list.....50&10&5%  
Ties, Wall—  
Cleveland, Steel.....\$ 1000, \$10.00  
Tinnners' Shears, &c.—  
See Shears, Tinnners, &c.  
Tinware—  
Stamped, Japanned and Pieced, sold very generally at net prices.  
Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.  
Tobacco Cutters—  
See Cutters, Tobacco.  
Tools—  
Coopers'—  
Shaves, Cincinnati Tool Co.....20%  
L. & J. White.....20&20&5%  
Saw—  
Atkins' new list.....40%  
Simonds'.....33 1/2%  
Transom Lifters—  
See Lifters, Transom.  
Traps—Game—  
Newhouse.....50&50&10%  
Onida Pattern.....80&80&5%  
Sensible.....33 1/2%  
Mouse and Rat—  
Dandy.....1/2 doz. \$1.75  
Marty French Rat and Mouse Traps (Genuine):  
No. 1, Rat.....1/2 doz. \$15.00  
No. 3, Rat.....1/2 doz. \$5.85  
No. 3 1/2, Rat.....1/2 doz. \$4.50  
No. 4, Mouse.....1/2 doz. \$4.30  
No. 5, Mouse.....1/2 doz. \$3.00  
Hotchkiss Metallic Mouse, 5-hole traps, 1/2 doz. 6 1/2; in full cases, 1/2 doz. 60¢  
Hotchkiss Imp. Rat Killer.....1/2 gr. \$12.50  
Hotchkiss New Rat Killer.....1/2 gr. \$12.50  
Mouse, Wood Choker, 1/2 doz. holes 8¢  
Mouse, Round Wire, 1/2 doz. \$1.50.....10%  
Mouse, Sensible.....33 1/2%  
Rat, Decoy, 1/2 gr. \$10.00.....10%  
Rat, Sensible.....33 1/2%  
Schuyler's Rat Killer, No. 1, 1/2 gr. \$13.50; No. 2, 1/2 gr. \$15.00  
Fly—  
Balloon, Globe or Acme.....1/2 doz. \$1.25; 1/2 gr. \$13.50  
Harper, Champion or Paragon.....1/2 doz. \$1.75; 1/2 gr. \$16.50  
Triers—  
Butter and Cheese.....25%  
Trimmers, Spoke—  
Bonney's No. 1, 1/2 doz. \$2.75; No. 2, \$3.75  
Cincinnati.....25&10%  
Douglas', 1/2 doz. \$9.00.....30%  
Stearns'.....20&10%  
Trowels—  
Garden.....70%  
Disston's Brk and Plastering.....25&10%  
Peace's Plastering.....25&25&2%  
Rose Brick and Plastering.....30&30&10%  
Woodrough & McFarlin, Plastering.....25&10%  
Trucks, Warehouse, &c.—  
R. & L. Block Co.'s list.....40%  
Daisy Stove Trucks, Improved pattern, 1/2 doz. \$18.00  
Tubs, Wash—  
No. 1.....2  
No. 2.....3  
Galvanized, 1/2 doz. \$4.00 4 50 5 00  
Galvanized S. S. & Co., with Wringer Attachment, 1/2 doz. No. 10, \$6.25; No. 20, \$6.75; No. 30.....\$7 50  
Twine—  
Binder—  
White S sal. 500 feet to b.....81&28%  
Standard 500 feet to b.....81&28%  
Manila, 600 feet to b.....91&91%  
Pure Manila, 650 feet to b.....91&10%  
Miscellaneous—  
Flax Twine—  
No. 0, 1/4 and 1/2 B Balls.....20% 24%  
No. 12, 1/4 and 1/2 B Balls.....17% 20%  
No. 15, 1/4 and 1/2 B Balls.....14% 17%  
No. 24, 1/4 and 1/2 B Balls.....14% 17%  
No. 36, 1/4 and 1/2 B Balls.....18% 16%  
Ch. Line, Cotton, 1/4 B Balls.....18&20%  
Cotton Twine, 6, 9, 12 and 15 lb to doz. 80¢

Cotton Wrapping, 5 Balls to b.....9&16¢

American 2-Ply Hemp, 1/4 and 1/2 B Balls.....9&10¢  
American 3-Ply Hemp, 1 B Balls.....9&10¢  
American 3-Ply Hemp, 1 B Balls (Spring Twine).....10&11¢  
India 2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....8¢  
India 3-Ply Hemp, 1 B Balls.....8¢  
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....7 1/2¢  
Mason Line Linen, 1/2 B Balls.....45¢  
No. 204 Mattress, 1/4 and 1/2 B Balls.....34¢  
Wool.....5&5 1/2¢  
Vises—  
Solid Box.....60&10&60&10&10%  
Parallel—  
Bonney's.....50&5%  
Fisher & Norris Double Screw.....15&10%  
Hollands'.....40&10&10%  
Massey's Perfect.....20&25%  
Massey's Clincher.....40&40&10%  
Morrill's.....45&10%  
Miller's Falls.....20&25%  
Parker's Oval Slide.....50&10%  
Parker's Victor.....30%  
Prentiss.....20&25%  
Sargent's.....70&10&70&10&10%  
Simpson's Adjustable.....40%  
Stevens'.....25&30%  
Toles' Woodworking.....25%  
Trenton.....40&5&40&10%  
Saw Filers—  
Bonney's, Nos. 2 & 3, \$15.00.....50&10%  
Cincinnati.....25&10%  
Reading.....40&10%  
Stearns' Common, Nos. 0, 1, 2 & 3.....50%  
Stearns' Rubber Jaw, Nos. 10 & 33, 33¢  
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....40%  
Miscellaneous—  
Bignall & Keeler Combination Pipe Vise.....60&5%  
Parker's Combination Pipe:  
87 Series.....60%  
187 Series.....60&5%  
No. 870.....40%  
Wads—Price Per M.  
U. M. C. & W. R. A.—B. E., 11 up.....60¢  
U. M. C. & W. R. A.—B. E., 9 & 10.....70¢  
U. M. C. & W. R. A.—B. E., 7.....80¢  
U. M. C. & W. R. A.—B. E., 7.....80¢  
U. M. C. & W. R. A.—P. E., 11 up \$1.00  
U. M. C. & W. R. A.—P. E., 9 & 10.....1.25  
U. M. C. & W. R. A.—P. E., 8.....1.50  
U. M. C. & W. R. A.—P. E., 7.....1.50  
Ely's B. E., 11 and larger.....\$1.70; 12 & 13 \$1.70; 14 & 15 \$1.70; 16 & 17 \$1.70; 18 & 19 \$1.70; 20 & 21 \$1.70; 22 & 23 \$1.70; 24 & 25 \$1.70; 26 & 27 \$1.70; 28 & 29 \$1.70; 30 & 31 \$1.70; 32 & 33 \$1.70; 34 & 35 \$1.70; 36 & 37 \$1.70; 38 & 39 \$1.70; 40 & 41 \$1.70; 42 & 43 \$1.70; 44 & 45 \$1.70; 46 & 47 \$1.70; 48 & 49 \$1.70; 50 & 51 \$1.70; 52 & 53 \$1.70; 54 & 55 \$1.70; 56 & 57 \$1.70; 58 & 59 \$1.70; 60 & 61 \$1.70; 62 & 63 \$1.70; 64 & 65 \$1.70; 66 & 67 \$1.70; 68 & 69 \$1.70; 70 & 71 \$1.70; 72 & 73 \$1.70; 74 & 75 \$1.70; 76 & 77 \$1.70; 78 & 79 \$1.70; 80 & 81 \$1.70; 82 & 83 \$1.70; 84 & 85 \$1.70; 86 & 87 \$1.70; 88 & 89 \$1.70; 90 & 91 \$1.70; 92 & 93 \$1.70; 94 & 95 \$1.70; 96 & 97 \$1.70; 98 & 99 \$1.70; 100 & 101 \$1.70; 102 & 103 \$1.70; 104 & 105 \$1.70; 106 & 107 \$1.70; 108 & 109 \$1.70; 110 & 111 \$1.70; 112 & 113 \$1.70; 114 & 115 \$1.70; 116 & 117 \$1.70; 118 & 119 \$1.70; 120 & 121 \$1.70; 122 & 123 \$1.70; 124 & 125 \$1.70; 126 & 127 \$1.70; 128 & 129 \$1.70; 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**Washers—****Leather, Axle—**

Solid.....	80&10&10&25
Patent.....	85&85&25
Coil;.....	11& 13& 14& 17& 100.

**Iron or Steel—**

Size bolt.....	5-16 3/4 1/2 3/4 1
Washers.....	3.00 3.00 2.25 2.00 2.00
In lots less than one keg add 1/4¢ per lb.	
5-lb boxes add 1/4¢ per lb.	

**Washer Cutters—**

See Cutters, Washer.

**Washing Machines—**

See Machines, Washing.

**Water Coolers—**

See Coolers, Water.

**Weather Strips—See Strips,**

Weather.

**Wedges—**

Oil Finish.....	2.10¢
Axe Finish.....	2.45¢

**Weights, Sash**

Eastern: Carloads at factory.....	\$16@17
Less than carloads.....	\$17.00@19.00
Western: Carloads at factory.....	\$13.50@14.50
Less than carloads at factory.....	\$4.50@16.00

**Well Buckets Galvanized**

See Pails, Galvanized.

**Wheels, Well—**

8-in., \$2.00; 10-in., \$2.50; 12-in., \$2.75	
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**Wire and Wire Goods—**

Market: Nos. 0 to 15	
Br. & Ann.....	Market very
Cop'd.....	unset led.
Galv.....	See
Tin'd, Tin'd list.....	Trade
Stone, Br. and Ann'd.....	Report.
Nos. 16 to 18.....	
Nos. 19 to 20.....	
Nos. 27 to 30.....	

Annealed Wire on Spools.....	60&100@60&10&5¢
Brass, list Feb. 26, '96.....	20¢
Copper, list Feb. 26, '96.....	20¢

Cast Steel Wire.....	50¢
Mallin's Ann'd & Tin'd on Spools.....	50&20¢
Mallin's Brass & Cop. on Spools.....	50&10¢
Steel Music Wire, 12 to 30, Imported.....	60@70¢ per lb
Stubs' Steel Wire.....	\$0.00 to 2, 40¢
Wire Clothes Line, see Lines.....	
Wire Picture Cord, see Cord.....	

**Bright Wire Goods—**

Iron.....	90&25@90&30¢
Brass.....	90&30@10¢

**Wire Cloth and Netting—**

Galvanized Wire Netting.....	80&20¢@5¢
Painted Screen Cloth 100 ft.....	95¢@1.10¢

See Trade Report

**Wire Barb—See Trade Report.****Wire, Rope—See Rope, Wire.****Wrenches—**

Agricultural.....	80&5@80&10¢
Baxter's S.....	70@70&5¢
Coe's Genuine.....	40&10&5&5&3¢
Coe's "Mechanics".....	40&10&10&5&5&3¢
Aeme.....	60@60&5¢
Alken's Pocket (Bright).....	\$2.00@3.20
Aligator.....	70@70&10¢
Bemis & Call's.....	35&5¢
Adjustable S.....	35&5¢

Adjustable S Pipe.....	40¢
Brig's Pattern.....	30&10¢
Combination Black.....	40&10¢
Combination Bright.....	40&5¢
Cylinder or Gas Pipe.....	55¢
Extra Heavy.....	45¢
Merrick's Bright.....	50¢
No. 3 Pipe, Bright.....	50¢
Bit Wrench, Adj., Tatum's.....	50¢
Boardman's.....	30¢
Bull Dog, W. & B.....	70¢
Combination Wrenches.....	25&10¢
Donohue's Engineer.....	40&10¢
Eagle.....	50&10¢
Hercules.....	70&10¢
Stevenson.....	60&10¢
Tatum's Brace Socket.....	40¢
W. & B. All Steel Pipe.....	50&10¢
W. & B. Drop Forged Engineers.....	35@40&10¢

**Wrought Goods—**

Staples, Hooks, &amp;c., list March 17, '92

90¢@90&amp;10¢

**Yokes, Neck—**

Cover Saddlery Works, Trimmed, 70¢

Covert Saddlery Works, Neck Yoke

Centers.....70¢

**Yokes, Ox, and Ox Bows—**

Fort Madison's Farmers' &amp; Freighters.....20¢

**PAINTS, OILS AND COLORS.—Wholesale Prices.****White Lead, Zinc, &c.**

Lead, Foreign white, in Oil.....	8 @ 5 1/4
Lead, American White, in Oil:	
Lots of 500 lb or over.....	5 1/4 @ 5 1/4
Lots less than 500 lb.....	6 1/4
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	6 1/4
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1
Lead, White, in oil, 1 to 5 lb as-	
sorted tins, add to keg price.....	1 1/4
Lead, White, Dry in bbls.....	5
Lead, American, Terms: On lots of 500	
lbs. and over, 60 days, or 2% for cash if	
paid in 15 days from date of invoice.	
Zinc, American, dry.....	3 3/4 @ 4 1/4
Zinc, French, S. & B. Red Seal.....	7 1/2
Zinc, French, S. & B. Green Seal.....	7 1/2
Zinc, Paris, Red Seal.....	8 1/4
Zinc, Paris, Green Seal.....	9 1/4
Zinc, Antwerp, Red Seal.....	7 3/4
Zinc, Antwerp, Green Seal.....	8 1/4
Zinc, V. M. in Poppy Oil, G. Seal	
lots of 1 ton and over.....	10 1/4
lots less than 1 ton.....	10 3/4
Zinc, V. M. in Poppy Oil, Red Seal	
lots of 1 ton and over.....	9 1/4
lots less than 1 ton.....	9 3/4
Discounts.—V. M. French Zinc.—Dis-	
counts to buyers of 10 bbl. lots of one or	
assorted grades, 1%: 25 bbls., 2%: 50 bbls.,	
4%: No discount allowed on less than 10	
bbl. lots.	

**Dry Colors.**

Black, Carbon.....	5 @ 40
Black, Drop, Amer.....	2 1/2 @ 5
Black, Drop, Eng.....	5 @ 10
Black, Ivory.....	10 @ 20
Blue, Celestial.....	8 @ 8
Blue, Chinese.....	30 @ 35
Blue, Prussian.....	28 @ 32
Blue, Ultramarine.....	5 @ 30
Brown, Spanish.....	1 1/2 @ 1
Brown, Vandyke, Amer.....	1 1/2 @ 2 1/2
Brown, Vandyke, Foreign.....	2 1/2 @ 5
Carmine, No. 40, in bulk.....	\$2.20@2.25
Carmine, No. 40, in bottles.....	2.35¢
Carmine, No. 40, in ounce bot.....	3.50@3.60
Green, Chrome, ordinary.....	2 @ 10

Green, Chrome, pure.....	18 @ 24
Lead, Red, bbls. and 1/2 bbls.....	5 1/2 @ 5 1/2
Lead, Red, kegs.....	5 1/2 @ 5 1/2
Litharge, bbls. and 1/2 bbls.....	5 1/2 @ 5 1/2
Litharge, kegs.....	5 1/2 @ 5 1/2
Ocher, French Washed.....	1 @ 1 1/4
Ocher, German Washed.....	4 1/2 @ 5
Ocher, American.....	5 ton \$8.00@17.00
Orange Mineral, English.....	8 1/4 @ 9 1/4
Orange Mineral, French.....	10 1/4 @ 10 1/4
Orange Mineral, German.....	8 1/2 @ 8 1/2
Orange Mineral, American.....	8 @ 8
Red, Indian, English.....	4 1/2 @ 8 1/4
Red, Indian, American.....	2 1/2 @ 3
Red, Turkey.....	4 1/2 @ 8
Red, Tuscan.....	7 @ 14
Red, Venetian, Amer.....	100 lb 60 @ 70
Red, Venetian, English.....	\$1.05@2.00
Sienna, Italian, Burnt and	
Powdered.....	4 @ 9 1/4
Sienna, Ital., Raw, Powd.....	2 1/2 @ 7
Sienna, American, Raw.....	1 1/4 @ 1 1/4
Sienna, American, Burnt and	
Powdered.....	1 1/4 @ 1 1/4
Talc, French.....	100 lb 90 @ 1.50
Talc, American.....	40 @ 85
Terra Alba, French.....	100 lb 90 @ 1.00
Terra Alba, English.....	75 @ 80
Terra Alba, American No. 1.....	75 @ 75
Terra Alba, American No. 2.....	45 @ 50
Umber, Turkey, But. & Pow.....	2 1/2 @ 3
Umber, Turkey, Raw & Powd.....	2 1/2 @ 3
Umber, But. Amer.....	1 1/4 @ 1 1/4
Umber, Raw, Amer.....	1 1/4 @ 1 1/4
Yellow, Chrome.....	10 @ 25
Vermillion, American Lead.....	6 @ 10
Vermillion, Quicksilver, bbls.	
or kegs.....	9 @ 11
Vermillion, Quicksilver, bags.....	9 @ 11
Vermillion, Quicksilver, sm'r pkgs.....	9 @ 11
Vermillion, English, Import.....	70 @ 75
Vermillion, Artificial.....	5 @ 20
Vermillion Chinese.....	70 @ 75

**Colors in Oil.**

Black, Lampblack, Best.....	10 @ 13
Black, Lampblack, Common.....	7 @ 9
Blue, Chinese.....	35 @ 40
Blue, Prussian.....	25 @ 35
Blue, Ultramarine.....	16 @ 20

Brown, Vandyke.....	7 @ 12
Green, Chrome.....	7 @ 11
Green, Paris.....	17 @ 22
Sienna, Raw.....	7 @ 10
Sienna, Burnt.....	7 @ 10
Umber, Raw.....	6 @ 10
Umber, Burnt.....	7 @ 10

**Miscellaneous.**

Barytes, Foreign, 1/2 ton.....	\$20.00@23.00
Barytes, Amer. doated.....	18.00@20.00
Barytes, Crude.....	8.00@10.00
Chalk, in bulk.....	2.00 @
Chalk, in bbls.....	100 lb 35 @
China Clay, English.....	10.00@17.50
Cobalt, Oxide.....	100 lb 30 @ 40
Whiting, Common.....	100 lb 30 @ 40
Whiting, Gilders.....	40 @ 45
Whiting, extra Gilders.....	55¢
Paris Green:	
Arsenic, kegs or casks.....	12
Kegs, 100 lb @ 175 lb.....	12 1/2
Kits, 14, 28, 56 lb.....	13 1/2
Paper Boxes, 1/2 @ 5 lb.....	13 1/2
Paper Boxes, 1 lb.....	14
Paper Boxes, 1/2 lb.....	15
Paper Boxes, 1/4 lb.....	16

**Putty.**

In barrels and 1/2 bbls.....	14-10 @ 1 1/4
In tubs.....	1 1/2 @ 1 1/2
In tin cans.....	1 1/2 @ 2
In bladders.....	1 1/2 @ 2

**Spirits Turpentine.**

In Southern bbls.....	@ 18 ¢
In machine bbls.....	@ 18 1/2 ¢

**Glue.**

Low Grade.....	7 @ 9
Cabinet.....	11 @ 15
Medium White.....	15 @ 15
Extra White.....	15 @ 25
French.....	10 @ 25
Irish.....	10 @ 12 1/2

**Animal Fish and Veget-**

Linseed, City, raw.....	gal. 40 @ 41
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Linseed, City, boiled.....	42 @ 43
Linseed, Western, raw.....	39 @ 40
Linseed, raw Calcutta seed.....	54
Lard, Prime City, present make.....	44 @ 46
Lard, City, Extra No. 1.....	35 @ 37
Lard, City, No. 1.....	29 @ 31
Cotton-seed, Crude.....	17 @ 19
Cotton-seed, Summer Yellow,	
prime.....	23 @ 23 1/2
Cotton-seed Summer Yellow	
off grades.....	21 1/2 @ 22
Sperm, Crude.....	55
Sperm, Natural Spring.....	57 @ 59
Sperm, Bleached Spring.....	61 @ 63
Sperm, Natural Winter.....	62
Sperm, Bleached Winter.....	65
Whale, Crude.....	40
Whale, Natural Winter.....	48
Whale, Bleached Winter.....	50
Whale, Extra Bleached Win.....	52
Menhaden, Crude, Sound.....	23 @ 23
Menhaden, Light Pressed.....	23 @ 23
Menhaden, Bleached Winter.....	34
Menhaden, Extra Bleached.....	34
Tallow, Western, prime.....	40 @ 41
Cocoanut, Ceylon.....	64 @ 64
Cocoanut, Ceylon.....	64 @ 64
Cod, Domestic.....	36 @ 36
Cod, Newfoundland.....	36 @ 36
Red Elaine.....	38 @ 38
Red Saponified.....	38 @ 38 1/2
Rank.....	gal. @ 26
Strait.....	26 @ 26
Olive, Italian, bbls.....	56 @ 58
Neatsfoot, prime.....	40 @ 42
Palm, prime, Lagos.....	5 @ 5 1/4

**Mineral Oils.**

Black, 29 gravity, 25¢ cold	
test.....	gal. @ 7 1/2
Black, 29 gravity, 15¢ cold test.....	@ 8 1/2
Black, summer.....	@ 7
Cylinder, light filtered.....	@ 15 1/2
Cylinder, dark filtered.....	@ 16
Paraffine, 23¢ gravity.....	@ 9 1/4
Paraffine, 25 gravity.....	@ 9 1/2
Paraffine, 28 gravity.....	@ 7 1/2
Paraffine, red, No. 1.....	@ 9
In small lots 1/4¢ advance.	

# THE IRON AGE.

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